Industrial Finishing

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From the Editor's Window

FOR MANY individuals July is vacation time, but for active organizations in certain industries it is a month of doing big things with the expectation of obtaining profitable results. For example, in the furniture industry huge market exhibitions are being held in both Chicago and Grand Rapids during the two-week period of July 7 to 19 inclusive.

Furniture manufacturers have given more than ordinary attention to the designs and finishes of goods prepared for these exhibitions, and now that the big shows are on, everyone in the furniture industry and everyone doing business with furniture manufacturers sincerely hope that the buying at these markets will be sufficiently encouraging to accelerate production activities in the furniture and allied industries. In this connection, it is hoped that no furniture manufacturers will become panicky and begin slashing prices which will result in the production of more cheap furniture and more unsatisfactory profits—if not actual losses—for furniture manufacturers and all who deal with them.

Some of the automobile manufacturers plan to bring out, this month or next, new models which they feel confident will give an added impetus to sales. Leading automobile manufacturers never lose faith in the future, but continually strive to improve their products and their manufacturing and service facilities in order to be able to offer greater values and better service to the motoring public, at the same or lower prices.

Whatever added activity occurs in one or more large industries will naturally help business in general, and an improvement in the conditions that have prevailed so far this year will be more than welcome. Obviously, the more wage earners and salaried people that can be maintained on payrolls, the more buying there will be in all commodities. Much buying has been deferred for months, and at the first signs of sufficient activity to restore general confidence there will be an increasing volume of business in all lines.

W. H. Rohr

Managing Editor

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How Much Total Solids in Finishing Materials

By S. P. WILSON

Manager of Lacquer Department at Varnish Products Co., reveals information that completely clears up some frequent misconceptions about actual amounts and percentages of solids in different finishing materials

THE FINISHER of today has a much better understanding of the difference between the actual content of solids in a varnish, lacquer or shellac and the so-called "good body," as measured by apparent thickness or viscosity, than his predecessors ever did. He knows that it is possible to "body up" varnishes and lacquers without in any way adding to the material actually left behind on drying—and generally he is not fooled by the specious argument that because a material is thicker and requires more reducer to bring it to applicable viscosity that it is necessarily an economy. He has begun to ask, and the salesman of finishing materials is prepared to answer: "How much total solids is there in your product?"

Vehicle and Solids

Practically all finishing materials can be said to consist of two portions: the volatile solvent or "vehicle," which carries the non-volatile material and which itself disappears completely by evaporation, and the "total solids," or true film-forming material which includes oils, resins, pyroxylin, pigments, plasticizers and in fact, all substances which taken together dry to give a film of finishing material.

Briefly, the method of determining total solids is to weigh accurately a small portion of the thoroughly mixed material in a weighed dish, evaporate off all volatile solvents, and weigh the residue. The percentage of the original sample left behind is what is commonly called the percentage of total solids. In actual practice many refinements of analytical procedure are required to get accurate results, owing to such factors as ready volatility of some solids such as camphor, oxidizability of some oils (with corresponding increase in weight) etc., but the exact methods of analysis are outside the sphere of this article.

In varnishes, the total solids run generally between 40 and 60%, while in lacquers they run between 8 and 50% as a rule, the low figure representing a cheap bronzing liquid and the latter a heavily concentrated pigmented lacquer. Disregarding for the moment the quality of the ingredients used, which affects markedly the appearance and durability of the film, it is fairly obvious that these percentages determine the spread or coverage of the product. Many salesmen of finishing materials have of late been stressing this point; a legitimate action if considered in

conjunction with other points but one which by itself is apt to be misleading.

Percentages by Weight

In the first place, percentages by weight take into account the specific gravities of the solvents used, as well as those of the solid ingredients. A light vehicle thus gives an apparently higher percentage of solvents than a heavier one, while the actual weight of solids in a gallon is the same.

As an illustration let us take two lacquers, each containing 24-oz. of solids in a gallon. One lacquer contains heavy solvents and thus weighs say 9-lbs. per gallon, while the other has light solvents and only weighs 8-lbs. per gallon. On a weight percentage, the first will analyze 16.67% and the second 18.75%, yet the actual solids as measured by coverage will be the same. This gives some idea of the contradictory results one can obtain by using figures without a more than superficial understanding of what they connote.

Lacquer Reducing or Thinning

Another variation on this point is met with when finishing materials are reduced. The obvious thought is that when a lacquer containing 40% total solids is reduced to equal parts by volume with a thinner, the resulting solution will contain 20%. This would be correct only if the thinner and the lacquer were of the same specific gravity, but, since it is an almost invariable rule that thinners are lighter than lacquer, it develops that the total solid content of the thinned solution is higher than calculated.

Let us again consider a concrete illustration: assuming that the lacquer weighed 9-lbs. per gallon and the thinner 7.5-lbs.; there was originally 40% of 9-lbs. or 3.6-lbs. of solids in a gallon. After reduction we have the same 3.6-lbs. in 16.5-lbs. of combined lacquer and thinner or 21.8% instead of the 20% first assumed.

May I emphasize here that the material of higher total solids is not necessarily the better one. The nature and proportion of the ingredients is far more important insofar as true quality is concerned, and it is only when these factors are proved identical that the matter of total solids may be considered, if quality is sought for.

In pigmented goods, for instance, it may be possible to secure splendid coverage and quality by the use of a small amount of high-grade pigment. A competitive article may use a much higher weight of pigment and inert extender to get the same effect with greatly lessened durability, and yet this article may show 20% more total solids than the first. Similar examples can be given by the dozen.

Cutting Shellac

In the shellac and substitute shellac industries, the total solids are generally expressed as cuts of so many pounds gum per gallon of solvent. These resins are generally considered to bulk, when dissolved, 10-lbs. per gallon. This figure is a rough approximation used widely in the trade and scientifically rather inaccurate. On this assumption, however, a 4-lb. cut of shellac actually contains 2.68-lbs. in a gallon, and 8-lb. cut contains 4.44-lbs. and a 2-lb. cut 1.67-lbs. in a gallon.

From these figures we can readily see that the procedure often met with, to reduce an 8-lb. cut one volume to three volumes

of alcohol or a 4-lb. cut equal volumes will not give the equivalent of a 2-lb. cut. The first procedure will yield a solution containing 1.11-lbs. in a gallon, the second one with 1.43-lbs. as compared with 1.67-lbs. or the true 2-lb. cut.

Prefer Pounds Per Gallon

It is the writer's thought that a far better view of the solid content of finishing materials could be obtained if total solids were always expressed in terms of so many pounds or ounces in a gallon as purchased. This is particularly true since varnish, shellac and lacquer are almost invariably bought by the gallon and reduced and used by the gallon. Consequently, the suggested method will avoid, for finishing foremen and purchasing executives alike, the pitfalls in calculation discussed in this article.

Selecting the Spray Gun

With the many excellent spray guns on the market today, it is not such an easy task to select the type of spray gun one really ought to buy and use. Representatives of almost every manufacturer of spray guns can point to several large companies which, after making exhaustive tests, have selected their particular guns on which to standardize. One type of gun loses out in one plant but comes back strong in an identical plant next door, figuratively speaking. Evidently no one gun has yet been invented that will suit everybody.

The things that I believe should be looked for in any gun desired for satisfactory industrial service are:

1—A uniform spray; no splitting, no dry spots, no dark center, and as little mist or overspray as possible.

2—Parts that are interchangeable, making them easy to procure and inexpensive to stock.

3—To have complete control of air and liquid so that both can be regulated with ease.

4—Easy to clean, which is to have comparatively few parts in contact with the liquid, and have them accessible.

5—Does not clog readily.

6—To be as simple, mechanically, as possible.

7—To have balance and proper grip, so as not to tire the hand.

8—To be rugged so as to "hold up."

9—To have nozzles that can be readily and accurately adjusted.

Most of the guns now made are designed for low or moderate air pressure. The advantages of a low pressure at the spray nozzle I believe are evident and some of these advantages are as follows:

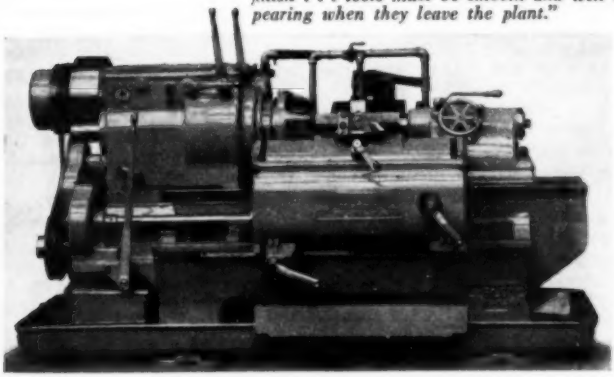
Greater covering capacity.
Less fumes, mist, overspray or drift.
Better flow.
Lower operating cost.
No removal of volatile content.
Better adhesion.

All of these points should be considered in making the proper selection and, after weighing them all pro and con, taking price into consideration, it is up to the buyer to make his choice.—M.M.M.

Hercules Promotes Use of Cellulose Products

The Hercules Powder Co., Wilmington, Del., has instituted an advertising and sales promotion campaign to develop new uses for lacquer and other nitrocellulose products. Although not a manufacturer of lacquer, the Hercules Company produces nitrocellulose, the basic ingredient of pyroxylin products and celluloid. The general business and industrial fields for the use of lacquer, outside its use as an automobile finish, are to be developed.

"Pride in our product demands a quality finish . . . tools must be smooth and well appearing when they leave the plant."



How LeBlond Machine Tools Are Finished

By
F. F. FETTER

Foreman Finisher of The R. K. LeBlond Machine Tool Co., Cincinnati, describes the finishing process for machine tools—the sandblasting, smoothing, air cleaning, sealing, priming, putty glazing, sanding, filling, (before machining) touching up and final finishing (after assembly)

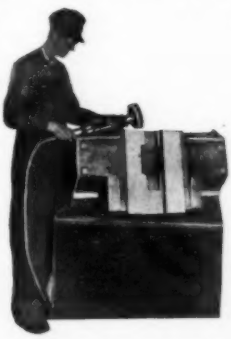
THE MACHINE tool industry covers the globe. Products made with machine tools reach out to the far corners of the earth, sail the seven seas and are used daily by all of us in our homes and offices. Truly they are the tools of industry. A machine tool, unlike many small tools, is not purchased each year or two, but must give years of satisfactory service. It naturally follows that the finish on these tools must be durable and permanently but conservatively attractive.

All castings are finished up to as far as the final coat before machining. This is done for reasons of economy. Oil and grease, spilled on the casting while it is being machined, can be easily and quickly removed from the finished surface, but it would be difficult to remove after it had penetrated the raw metal surface. If castings were machined before being finished, all bored bearing openings and milled surface areas would require masking before the finish could be applied. By finishing them first, the labor and masking material are saved.

So many different shapes and sizes of castings enter into the make up of the various machine tools that it would be impossible to select one definite example for description without omitting some important details regarding the finishing of others. Therefore I shall endeavor to treat them in classes of castings rather than as individual units.

Of course, all castings are sand-blasted inside and outside in the foundry. Our first operation in the finishing department consists of smoothing the surfaces. This we do with portable power grinding wheels. Fairly large flat areas are given special attention both in inspection and in leveling. An abrasive wheel 8-in. in diameter is used for this purpose, grinding with the 8-in. diameter surface of the wheel. We try to get all flat surfaces as level as possible because, in spraying two heavy coats of pyroxylin filler, an uneven surface would cause serious checking in the filler coats in the low places. Following the grinding operation, the castings are blown clean inside and outside.

I am placing considerable emphasis on cleaning the insides of castings. This applies only to those castings containing oil pockets in which gears operate; for instance, lathe heads and aprons. Such castings are given a spray coat of red lacquer sealer over the entire inner surface to seal the pores of the metal. This prevents any particles of sand or grit from working out into the lubricant in which the gears operate when the machine is in service.



The first operation—smoothing the casting with a portable grinder

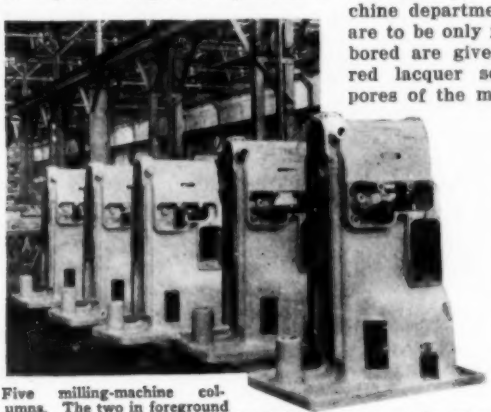
Now let us consider the finishing process on the class of castings having large flat surfaces, such as beds, covers, etc., as a basis. Following the cleaning after smoothing (grinding), castings are given a spray coat of lacquer primer which of course dries in a short time. Then, using a flexible knife, pyroxylin putty is glazed over any rough places and worked into any sand holes that may be in the surface. When the putty has dried (time will vary with the amount of putty applied) the glazed areas are lightly sanded with No. 2/0 sandpaper.

The casting, after being blown clean, is ready for the pyroxylin filler coat which is applied over all flat surfaces by the spray gun. We use 50-lb. pressure on the air-line gauge, and 20-lb. pressure at the tank to force this heavy filler material through the gun, which is opened up to the full spray. A heavy double coat (spraying in both directions) is "flowed" on the surface and allowed to dry for two hours. Then a second double filler coat is "flowed" on, and the casting is allowed to dry overnight.

Four to five hours would be sufficient drying time, but under ordinary circumstances the overnight drying period works out better according to our production schedule. Of course, on extremely large castings, only one side can be sprayed at a time; these castings are generally filled in the afternoon and allowed to dry over-

night. In the morning they are turned and filled on the other side.

When the filler coat is thoroughly dry, a spray coat of lacquer sealer is applied to prevent oil and grease (used in machining) from penetrating the lacquer filler.



Five milling-machine columns. The two in foreground have had their surfaces filled by knifing-in process; the other three have just been primed.

The casting is then taken to the machine department to be machined and assembled.

Of course, on castings that are round or which have an abundance of curved surfaces—such as lathe heads, aprons, carriages and tailstocks—it is impossible to flow the filler on with a spray gun. These castings go through the same finishing operations as our "basis process," described in preceding paragraphs, except for this difference: the filler coats are knifed on.

I find that an acceptable finish may be put on handwheels by taking the wheels just as they come from the sandblast and spraying on two coats of pyroxylin filler, allowing each coat 30 minutes to dry and following up with a spray coat of lacquer sealer. Handwheels are then ready to be machined. On a job of 200 wheels, this method saves about 15 hours over the "brush-filler, sanding method" formerly used.

Gears that are to be completely machined go directly to the machine department, but gears that are to be only face machined and bored are given a spray coat of red lacquer sealer to seal the pores of the metal, thus preventing any grit from working loose in the ultimate operation of the machine.

After assembly, the surfaces of a machine tool are washed off with naphtha, lightly sanded with No. 2/0 sandpaper, cleaned and inspected. Any scratches or rough places, made during the machining or assembling operations, are putty glazed, lightly sanded and touched up with lacquer sealer. The tool is now ready for the final enamel coat. In some cases this coat is applied by spraying; in others by brushing.

A machine tool having several polished metal parts, milled handles, etc., can be coated after assembly more economically by hand brushing than by spraying, because the greasing or masking of all polished and milled surfaces, and the subsequent cleaning, are eliminated. But take grinders for instance; these are finish coated in the spray booth to good advantage. The final enamel coat is allowed to dry about four hours, after which the tool is ready to be crated for shipment.

With the finishing room at the head of our production lines, it becomes the pace setter. Here's how we set the pace last year: eleven men kept 650 machine and vice hands busy producing 1,500 tons of finished machine tools. Formerly 44 men were employed in the paint department when hand methods were used to produce the same tonnage during the same length of time.

At the spray booth where two spray operators can work at the same time. One man is shown spraying a casting suspended from an electric hoist mounted on the I-beam arm of a small crane.

How I Use Crystal Lacquers

By F. MANNHARDT

Foreman finisher explains in detail the application of color and clear crystal lacquers, the placing and treatment of decorative effects and the baking of the finish—with supplementary suggestions about straining material, lacquer consistency, spray pressure and oven heat.

CRYSTAL LACQUER is coming into extensive use as a decorative finish for radios, household appliances, office machines, metal caskets and many other articles made of metal, wood or composition material. While a good grade of crystal lacquer is practically foolproof in the hands of an experienced finisher, I have heard of some finishers having trouble with this material.

Consider for instance, a black crystal, one-coat finish: After the surfaces to be finished have been cleaned thoroughly of grease and dirt, I spray on a clear lacquer at a pressure of 50 to 60-lbs. (In my experience, dip or brush applications of crystal finish are not satisfactory.) Since the lacquer is comparatively heavy, a moderately high air pressure is essential for proper atomization. I always strain crystal enamel, even though it comes from a new can that has just been opened, as sometimes the lacquer coagulates in the can. Before straining, if there is a possibility that the

material is chilled, it is well to warm it to about 74°F.

Oven Heat; Precautions

The bake oven should be in proper condition to receive the freshly coated articles before spraying begins. To kill off the oxygen in the oven, close the dampers and door and turn on the heat until the oven is warmed; then the door can be left open about 2 or 3-in., if precautions are taken so that no draft can enter. Maintain an oven temperature of between 125° F. and 140° F. Place the articles in the oven as soon as they are sprayed. The finish should crystallize in 15 to 30 minutes, after which it is customary to open the drafts of the oven and bake the finish until it is dry.

An important factor in the crystallizing process is to secure an even distribution of heat in the oven; otherwise the finish will not crystallize uniformly. A draft striking the freshly sprayed articles will usually ruin the crystallizing process, therefore, it is advisable to keep all doors and windows closed and allow no one to enter the finishing room before the oven doors are closed on the last piece.

Two-Coat and Color Jobs

For a two-coat crystal lacquer finish, the procedure is the same as for single-coat jobs—with the exception of spraying on a ground coat of plain black baking enamel and baking it before applying the crystal lacquer. I have found that this method will give more certain results, as the first coater is really a primer and tends to eliminate dull spots due to the porosity, roughness or pitted condition of the metal; otherwise the procedure is the same as for a one-coat finish. Either black or clear crystal may be sprayed for the second coat, but the clear (so far as I have observed) has the greenish cast of varnish in it, while the black has not.

For a colored crystal finish, a ground coat is applied first. For instance suppose an apple-green color is wanted. First, I spray on a coat of apple-green undercoater; then over this I spray clear crystal lacquer. Where decorations are to be applied—such as striping, lettering, decalcomania—it is best to place them before the clear crystal coat is put on.

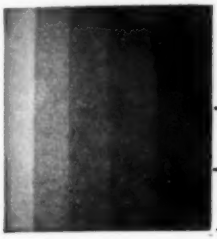
Lacquer Consistency

It has been my experience that the heavier the crystal lacquer is sprayed on, the larger the crystals will be, but it takes experience with a particular crystal material in order to know when the maximum point is reached, or in other words how heavy the coating can be made without causing runs or smudges.

Some kinds of crystal lacquer can be thinned, but it is best to obtain complete information from the lacquer manufacturer—or perhaps have his service man demonstrate the material in your own plant before altering any crystal lacquer or enamel for other than the prescribed use. A word of advice here; don't insult the service man's intelligence by ignoring his recommendations or suggestions after you have asked him for help.

Paasche's New Detroit Address

Paasche Airbrush Co., 1921 Diversey Pkwy., Chicago, announces that its Detroit branch is now located at 8320 Woodward Ave. E. A. Johnson continues as Branch Manager, assisted by F. G. Case and C. F. Zimmerman.



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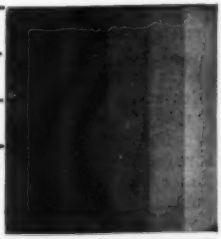

Production Striping with Mechanical Striper

By
W. J. MISKELLA

Consulting Engineer on finishes and finishing problems calls attention to the mechanical features of one type of striping tool, tells how to use it and explains about the preparation of striping colors

SEVERAL DIFFERENT makes of striping tools have been developed and placed in successful service in industry within the past two years. These labor-saving tools are being adopted extensively for the work formerly done by skillful stripers working with a hand brush. An inexperienced workman can learn how to use a striping tool within a comparatively short time and, once he learns the "knack of using it," he can do more work than the hand-brush expert, and his work will be clean, neat, accurate and uniform.

The success of the mechanical striping tool illustrated in this article was not reached without the development of many related and interesting features connected with striping operations. For example, interchangeable nibs to provide stripes of various widths, a revolving turret head with automatic stops by means of which the position of the striping pen may be set at any angle and pulled toward the operator, pushed to the left or to the right and even backward.

Guide and Material Cup

The revolving wheel guide provides a means for uniformly striping a curve or round surface, since the wheel guide not only helps to hold the tool as it is moved along in the act of making the stripe, but it also aids in maintaining a uniform distance between the striper and the surface that is being worked on.

The swivel adjustable guide, with its self-aligning point, serves to hold the striper in the proper position as it is moved along a moulding or some other stationary guide—the edge of the piece that is being striped, for example.

A slanting swivel cup containing the material may be swung out of place in the event a difficult corner is encountered where the material cup might interfere. The tool is held in position after the flow of

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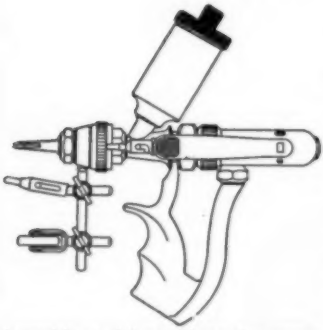
Factory — Rochester, Pa.

the striping medium has been once established by the simple test of letting a number of drops flow from the pen part at a certain rate per minute with the adjustment open full. As soon as this has been done there is no further difficulty with the operation of the tool so long as the cup provided for the purpose is kept supplied with striping material.

Color Mixing for Striping

Proper mixing of the color is essential for continuous and uninterrupted striping. The color must be mixed into a free flowing consistency and it must be mixed, not in the container on the tool itself, but in a separate container. It is exceedingly important to have the consistency of the material just right; once this is accomplished there is no further trouble. It is not even necessary to have previous striping experience, except for speed in doing the work, and that may be readily acquired.



A precision tool for making stripes accurately and rapidly

When it is desired to make a wide stripe, a thicker consistency of color material must be used. On the other hand, when one desires to make narrow stripes, he must use a thin color mix. Since the material released from this tool is not forced out by compressed air, a stoppage of the flow sometimes occurs due to the solidification of lacquer, or any other quick-drying material, at the end of the tube inside the nib. The way to overcome this trouble is to remove the material tube from the cup and blow through it. Indeed, there is another little blowing trick, that may be used in starting the operation of the striper the first few times in order to get it flowing freely. That is to blow with the mouth through the little vent hole in the cover of the material cup.

Troubles to Look Out For

There are certain troubles that an operator may experience, but these can be easily overcome once he recognizes them. These troubles are classified into two main groups—the skipping of a line, and flooding or sagging of the material.

Skipping is caused by several things. The color may be improperly mixed, or it may be too heavy. Then perhaps there is not sufficient stroke of the finger lever due to having the adjustment cut down too fine. Proper regulation of the sleeve governing this feature will quickly overcome such difficulty.

The hardening or congealing of the color contained in the nibs has already been mentioned and comes under the classification of "skipping." There may be a stuck or loose needle which, once it is discovered, may be corrected by tightening the proper parts.

Flooding or sagging can be caused by color material that is too thin, or by too long a stroke of the finger lever which would

UNI-STAIN

The Quick Uniforming Stain with pigment so fine that it looks like a clear stain

THE pigment in Uni-Stain is invisible when applied on wood. Therefore, in uniforming gum and other woods, Uni-Stain produces a clear, transparent effect. Unlike an oil uniforming stain, it does not turn sap streaks dark. It needs little sanding and may be recoated with sealer in three hours without bleeding. Uni-Stain wipes in ten to fifteen minutes and has some filling qualities. On combination walnut-gum pieces to be finished by dipping, Uni-Stain may be used over all. It will not produce a muddy effect on any wood. Send for sample panel, or order five gallons at the drum price.

James B. Day & Co. Chicago

UNI-STAIN DRIES IN 3 HOURS

WON'T BLEED OR BLACKEN SAP STREAKS, WON'T SETTLE OUT OR CLOG SPRAY GUNS

James DAY & Co.

allow too much opening of the needle valve. Lastly, there is the important adjustment of the opening of the striping nibs.

Suggestions for Operator

Any operator who has had any drafting-room experience will appreciate the operation of this device. It is very similar to a drafting pen except that it is equipped with a fountain material supply device for continuous operation.

It is well for the operator to know exactly the function of each and every part in the device, and once this is understood there should be no cause for wonder as to why this or that happens, or why it does not happen. An example of the saving in time in comparison to brush work is revealed in the fact that one operator who was able to stripe a toy wagon wheel by hand in 90 seconds was able to use the mechanical striper and accomplish the same job in three seconds.

One of the interesting accessories used in connection with this striper is the so-called back-off nib. This is hollowed out at the end and acts as a start on an automobile moulding where a wide stripe is desired. In other words, the edges of the wide stripe are done with the back-off nib and the rest is filled in with a brush. Another accessory is the pressure cup for "upside down" striping, as on the ceiling, or any place difficult to reach in the ordinary way.

The tool is cleaned by flowing thinner through it after the color in the container has been removed. Sometimes it is desirable to have a small stiff brush available for quickly cleaning the nibs from any accumulation of color which may have hardened.

Cause and Prevention of Lacquer Bridging

In the ordinary lacquer finish, various defects are liable to occur which will mar the appearance of the finished surface. Usually these are caused more by incorrect methods of application than because of any fault in the finishing material. One of these troubles is commonly called "bridging," wherein excess finishing material remains in the angles, recesses and corners of the article, causing localized thickness which produces an uneven pull or strain during drying, eventually causing the finish to crack.

To prevent this, see that all accumulations of filler are removed from such places and allow more filler drying time for irregular surfaces than for flat surfaces.

When spraying such uneven surfaces with lacquer, incline the spray gun upwards at an angle of 45°. This will cause the air to be driven upwards and out of the angles and recesses, with the result that no air is trapped by the quick-drying lacquer.—W. E. Warner.

Nichols' Pacific Coast Branch Moves

The Nichols Products Corp, 12953 Greeley Ave., Detroit, Mich., announces that the Pacific Coast branch of this company has moved to 311 Lewis Building, Portland, Ore. Mr. E. G. Drew is in charge of the Pacific Coast office.

Paasche Establishes Export Department

The Paasche Airbrush Co., 1921 Diversey Pkwy., Chicago, states that its export business has grown so rapidly that it has become necessary to establish an export office, which is located at 11 West 42nd St., New York City, with Mr. W. L. Urquhart as Export Sales Manager.

ADVERTISING PAGES REMOVED

Buying Aircraft Finishes

By
L. H. CASS

The author tells what points to check when buying finishing materials for airplanes, because he "believes that an educational campaign, devoted to the question of quality in aircraft finishes, would be of interest and value"

RECENTLY I overheard a conversation between the purchasing agent of a commercial aircraft manufacturer and a salesman of dopes, lacquers, varnishes, etc., in the former's office. Apparently the salesman's prices were higher than those being paid by the manufacturer. The salesman suggested that a comparative test of his goods be made against his competitors, as it might be found that his goods were cheaper in the long run on account of greater durability on exposure.

The purchasing agent's answer was that as long as the finish lasted until the plane was sold he was satisfied. His point was that they were selling their ships at a low price and that the buyer could not expect much of the finish. Undoubtedly he carried this policy into his purchases of other raw materials. It is significant that this company is now in the hands of its creditors with little prospect of resuming operations.

The point is that the difference in cost per plane between the best dopes, lacquers, varnishes, enamels, etc., and the cheapest ones could have been only a few dollars, whereas the difference in service would be many months and might have spelled the difference between a disgruntled knocker and an enthusiastic booster. If the finish went to pieces in two or three months the buyer would naturally expect the manufacturer to recover and refinish the plane, at a cost running somewhere into three figures. If the manufacturer refused, he would certainly lose any chance of a resale and would send the buyer away in a bitter frame of mind toward his product.

Finishing materials can be compared to clothes. A man can buy a suit for anything he wants to pay, but he does not expect the same service from a $25 suit, that he does from one costing $75. In either case, one gets about what he pays for. There are so many manufacturers of finishing materials that there is little danger of paying too high a price for them, but there is great danger of getting second or third rate goods if the price is too low.

What to Check in Dopes

DRYING TIME: Must not be too fast, as excessively quick-drying indicates correspondingly rapid deterioration.

TAUTENING ABILITY: Must not tauten too fast or too tight, as it is liable to break the fiber of the fabric.

BRITTLENESS: A properly made dope should stand a good exposure test without cracking under thumb pressure.

ADHESION: Should penetrate the fabric and not form a superficial film which can be easily peeled off.

FILLING: Should build up a satisfactory surface on the fabric in a reasonable number of coats.

What to Check in Varnishes

DRYING: Must not dry too fast, as it will lose its elasticity with equal rapidity; 18 to 24 hours is about right.

TOUGHNESS: Should stand a bending test without cracking.

DURABILITY: Must adequately protect both wood and metal under continued exposure to the elements.

BODY ON THE WORK: A maximum of three coats should give a satisfactory film for any purpose.

In Dope Proof Paint

DRYING: Should dry sufficiently hard in four hours to withstand the solvent action of dope.

FILM: One coat should be sufficient.

In Metal Primers

ADHESION: Must stand a severe bending test without cracking, both with and without finishing coats.

BOND: Must provide a suitable foundation for succeeding coats.

SOLVENT RESISTANCE: Must not cut up under lacquer after drying 18 to 24 hours.

DRYING TIME: Quick-drying primers should be avoided, as they lack adhesion and flexibility.

DURABILITY: One full-body coat must prevent corrosion when exposed to the weather. Take no chances on a cheap primer, as a good one is the secret of a durable finish on metal.

In Interior Tube Coating

FLOWING: Must be sufficiently thin in body to flow freely and still leave an adequate protective film on the work.

CORROSION RESISTANCE: Must be a good rust preventive.

In Aircraft Enamels (Oil Base)

HIDING: Two coats should be sufficient over red oxide primer.

COVERING: One gallon should cover at least 500-sq. ft., one coat.

ELASTICITY: Must stand a good bending test when applied over a recommended primer, without cracking.

DURABILITY: Must endure a severe exposure test.

COLORS: Must be non-fading.

NOTE: I do not recommend lacquers for aircraft work, except possibly on metal where speed is essential, as I believe they do not stand vibration as well as oil enamels.

In Lacquer Enamels

HIDING: Two double coats should be sufficient.

COVERING: One gallon reduced to spraying consistency should cover at least 125-sq.ft. in one double coat.

COLOR: Must be fast.

DURABILITY: Should be determined by extended exposure tests.

Tests should all be conducted on a competitive basis. The plane manufacturer should select a list of established manufacturers of finishing materials and follow their recommendations in building up the finish. Panel tests are good, but the best method is to finish several planes with each system and keep them under observation, as an actual service test of this kind tells the real story.

The manufacture of commercial aircraft is becoming highly competitive and naturally each sales department is anxious to turn out as attractive looking ships as possible. Durability, however, should never be sacrificed for appearance. It is a lot easier to ex-

Making it Easier for *the Buyer!*

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To accomplish this it is necessary to cut costs at every possible stage and this calls for the co-operation of everyone in the industry.

Marietta can assist you in carrying out this program of economy, through the medium of new and simpler finishes.

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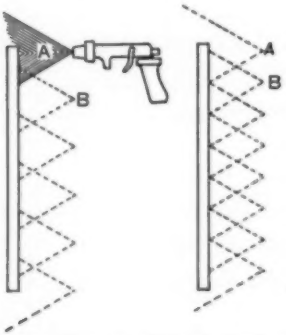
plain to the prospect why your ship has a less showy original appearance than your competitors' —easier than it is to explain to him why the finish has gone to pieces after short service. An airplane is an expensive article and the best is none too good in protecting it from the elements.

Lapping in Spraying

The amount of material used by different sprayers in coating the same article is too often a variable quantity. If tables were being coated, for instance, one man may use ¼ pint of material, and



another man ⅜ pint or even ½ pint. This is often due to the way in which the men were taught their business. There was no standardization, no deciding of the correct way to perform the operation.

Take the matter of the lapping of the spray; one man can spray as shown in Fig. 1, coating *A* with a forward motion and *B* with the backward motion. This may work out well for the cheaper work, or where material other than lacquer is being used so that a full heavy coat can be applied without impairing the finish.

A method decided upon in a factory manufacturing tables, is shown in Fig. 2, where the operator coats *A* with both forward and backward motion, lapping *B* a half spray over *A*, and also coating this and all other sprays with both the forward and backward strokes.

Of course, such matters as pressure, type of gun, opening of nozzle, consistency of material, etc., had to be decided upon before the above plan could be worked out. However, once the process is standardized, the exact amount of finish desired is given and the amount of material used by the various men does not differ by more than 10% to 20%, which in the case of hundreds of articles coated per day can present a worthwhile saving over the previous variations of 50% to 100%.—M. M. Miller.

Detroit Graphite Co., Now Part of the Valspar Corp.

The Valspar Corp., 386 Fourth Ave., New York City, announces that it has merged the Detroit Graphite Co., Detroit, Mich., and the Dominion Paint Works, Ltd., of Walkerville, Ont., as a part of this corporation. According to the announcement, there will be no change in management or loss of identity, good will or future individual growth of these units.

New Lacquer Protects Ignition Wires

Chemists at the laboratories of the E. I. DuPont de Nemours & Co., Inc., Wilmington, Del., working in cooperation with the technical staff of the Packard Electric Co., have developed a lacquer which, it is claimed, when applied to ignition cables of automobiles increases the general efficiency of the car 10% and more. This especially compounded lacquer is used for finishing the cotton braid surrounding the rubber covering of ignition cables. It is flexible at temperatures as low as zero and as high as 275° F.

Murphy No. 22 Flat Varnish

It doesn't *flash*!
It doesn't *streak*!
It doesn't *highlight*!

A new flat varnish that behaves just the way a flat varnish should

HERE you have, all rolled into one material, *every* essential of a flat varnish:

1—Uniform Flatness
2—Non-Flashing *(glossy streaks)*
3—Transparency *(non-clouding of wood grain)*
4—Not pigmented *(no settling)*
5—Good Building
6—Fast Hard-Dry

These important characteristics you will find developed to the highest degree of perfection in Murphy Flat Varnish No. 22.

Even in the poorest drying weather, work can be handled in a few hours and a "rock hard" dry overnight is assured.

You get a distinctive flatness that is *finer* than a real water and pumice rub, because of the absence of the cloudiness produced by the thousands of tiny scratches in rubbing.

For speed in application and shipment and for fine quality of finish, you owe it to yourself to try out Murphy Flat Varnish No. 22 immediately. If you want further information or a demonstration, write us.

MURPHY VARNISH COMPANY
Newark San Francisco Chicago
Essex Varnish Company, Newark
(Associate Company) *Baking Material Specialists*

MURPHY FLAT VARNISH No. 22

Murphy Flat Varnish No. 23
Flat Varnish No. 23 possesses all the qualities of uniformity and clarity of No. 22, but dries to a soft sheen.

Murphy Flat Varnish No. 24
Flat Varnish No. 24 dries to a high semi-gloss but otherwise shares the characteristics of No. 22 and No. 23.

What You Ought to Know About Colors

By
F. S. ARAKI

A preliminary discussion of color, what causes it, why and how to see it, what mixtures produce tints, shades, tones and hues, what colors harmonize and which ones produce suitable contrasts

TO DISCUSS color from all its angles is beyond the scope of this article. Here I have in mind taking up only what is the most important and immediately useful to us, so that we may learn more about it later on. We are chiefly interested in color of pigments, its practical applications and psychological effects.

Depend upon Light

Color, like the shadow, cannot exist without light. Ordinary light, which is of white color, is composed of electromagnetic waves of various wave lengths. When this light strikes bodies a certain portion of it is absorbed, but the remainder is reflected back and produces in our sense organs the effect of color. Some substances have a quality of absorbing all the waves, or very nearly so, and the result is a black.

If all white light is scattered back without losing much of its strength by reflecting and refracting, we have a white. Other bodies have a property of transmitting all the light waves but cannot absorb or reflect them in any way. They are transparent. On the other hand, there are many other substances that partially transmit the light waves, at the same time reflecting and absorbing a certain part of light. In such cases we have translucent colored bodies.

Highly polished surfaces, whether colored or transparent, when viewed at a certain angle reflect all the incident waves, therefore they appear as white. Wherever the light strikes very strong and reflects back completely without being broken down, as in cases of prominent parts on any surface, we have streaks or spots called "highlights." It is evident from this that light waves exist but colors do not. We have colors only when the waves reflect and enter our sense organs, therefore colors are sensations in our mind caused by electro magnetic waves, and altogether subjective to the condition of light and organs.

Principal Colors Available

In the absence of light waves all things are black. For example, the inside of a watermelon, before it is cut, is black; so is our blood in the body.

Theoretically there are three primary colors—red, yellow and blue—from which all other colors can be produced by combining them in different proportions. In practice, however, this is not the case, although we are able to obtain approximate results. The reason for this is we have not

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Former gum and shellac solutions used as wood sealers failed for two reasons. They shrank excessively into the wood. They did not form a sufficient union with the wood lacquer grades applied thereover. The newly-perfected Zellac Super Wood-Sealer reduces suction and shrinkage to a negligible factor. Moreover, the Super Wood-Sealer makes a perfect bond with any wood lacquer because of the affinity between lacquers of a common nitrocellulose nature. Zellac Super Wood-Sealer unites with both the wood and the wood lacquer, forming a finish of utmost adhesiveness, flexibility and durability, and eliminating checking and bridging. In addition, you have the finest finish with the least number of coats and the greatest economy. The new super-sealer represents the utmost in building, covering and even-sanding properties. You can guess in round figures what this will mean to you in greater finishing quality and more enduring beauty of finish—that is, in the salability of your wood products. Full particulars on request.

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true spectrum colors available.

A combination of two primary colors results in a secondary color; thus red and yellow make an orange; red blue a violet; blue and yellow a green. Red, blue and yellow of the primary class, and orange, green and violet of the secondary class are known as six principal or simple colors, and they constitute the entire gamut or chromatic scale. By adding indigo to the colors just named we have seven principal colors of spectrum. Indigo is not so readily distinguishable from violet or blue by average persons.

The tertiary colors are made by combinations of two secondary colors or mixtures of four primaries, and they are generally classified as the grays.

Warm, Cold and Strong Colors

Red is sometimes called as the middle color because it is in midway between the white and black. Yellow is nearer to white than any other color and, under the artificial light, it is often mistaken for a white. Blue is the nearest to black, and a dark blue is almost a black.

Red and yellow are warm colors from association with the color of fire, while blue is a cold color from association with the color of water or sky. So a warm color is one having a predominant value of red or yellow, while a cold color is one that has an excess of blue. When a color is made warm or cold by adding a necessary amount of red, yellow or blue, it does not change in color but only in hue. For instance, green is a mixture of blue and yellow. By adding more yellow we have a cheerful warm green, but if we add more blue there is a cold bluish green. They are all greens of differing hues.

Any pure determinate color that does not contain white, black or gray is called a postive or saturated color. By strong color is meant one that is high in the chromatic scale. Red is the highest with a wave length of about .723 mu*, followed by orange, yellow, green, blue, indigo and violet, which is of about .307 mu successively. A color can be changed in tone by adding a lighter or darker color. The lighter tones are tints and the darker tones are shades.

Color's Influence and Use

Most people generally prefer the determinate colors which are at once simple and clear. It has been argued by some scientists that the age, sex, nationality, etc. of people, have marked influences over the color taste, and that each class has a decided preference for certain color over others. Nothing has been proved conclusively thus far and such generalizations should be studied more carefully before being finally accepted.

As to the question of the legibility or perspicuity of colors, we have very little information, and a chart or formula is impossible. After all, it all depends upon the background on which the colors are presented, as well as the colors of neighboring designs and, to large extent, the condition of light available.

A strong contrast by the skillful use of complementary colors is recommended. It is claimed by some that green, red or blue on white is more visible at distance than black on white; and that black on orange is the strongest. I have not verified the statement so far, and have no comment to

*Millimicrom or millionth part of a millimeter. Mu is the M in Greek alphabet.

Expect different results from a different remover

If Lingerwett were made from the same materials, to the same formula, and by the same methods as other removers, you would expect about the same results.

Don't! Lingerwett is very different. The results are very different. If you have not found that out, you owe it to yourself to do so. It means *money saved*, to say nothing of a neater and very much easier job.

The Wilson-Imperial Co., Newark, N. J.

LINGERWETT REMOVER

By all odds the quickest and easiest known way to remove paint, varnish, shellac, lacquer, and enamel from old surfaces.

make. In camouflaging or puzzle painting, where the main object is to render the form and size of a ship, building, gun, wagon, etc., obscure and indistinct, much of blue, gray and black, and some green and yellow were used. They blend remarkably well with the background of field, sky or water.

We have but seven primary colors . . . the variety is far too small to be satisfactory in producing painted articles which are expected to be not only attractive but esthetically pleasing and to create the desire for possession.

Color Harmony; Contrasts

Combinations of colors that harmonize well are used extensively. They are so arranged that the colors enhance one another in richness and charm. We call such a desirable effect "the harmony of colors." It is generally held that complementary colors, and very nearly complementary colors, are harmonious when placed next to others; and in some cases they contrast also. Complementary colors are the opposite colors which are required to form a theoretical white or a neutral gray. Thus complementary colors of a yellow are none other than a voilet, or blue and red; of a blue, red and yellow (or an orange); of a green, red; of a violet, a yellow, etc, etc. Now let us make plain the term, "contrast." This is very important for we are enabled to produce harmony effectively by means of contrast. There are three kinds of contrast.

1—Contrast of tone
2—Contrast of hue
3—Contrast of tone and hue

We produce a contrast of tone by placing a tint and a shade of the same color next to each other.

By combining two different colors of the same tone next to each other, we get a contrast of hue.

Contrast of hue and tone is produced by placing two opposite colors—one of them dark and another one light—side by side.

Sometimes, when colors of different natures are brought together, they seem to affect one another in such a way as to produce a sort of optical illusion; their apparent colors seem somewhat modified or changed. For instance, if a gray is surrounded by a red or blue, the gray will appear tinged with green or orange as the case may be. This effect is known as simultaneous contrast.

It has been said that different colors play upon the mind in different ways and produce varied emotions. While this is true in many cases it must be understood that emotions so produced differ greatly in intensity and manner, according to the individual, as we associate colors with past experiences and recall incidents strongly impressed. On this basis—

Red might suggest: fire, hot, heat, warm, blood, kindness, true, love, valor, irritation, anger, wrath, cruelty, sin, etc.

Blue might indicate: water, ocean, summer time, sky, height, noble, loyalty, wisdom, cold, retiring, despondency, etc.

Yellow might remind one of: gold, wealth, crop, harvest, autumn, hope, cheer, wisdom, optimism, quarantine, sickness, stale, yellow, old, cowardice, etc.

Green might recall: spring time, trees and grass, growth, life, hope, youth, inexperience, jealousy, etc.

White might signify: light, purity, snow, innocence, happiness, light, etc.

Black: darkness, evil, night, defilement, mourning, desolation.

Paasche

The first universal Multiplehead Airbrush—the only convertible spraying device and the most highly perfected. Covers the widest range from finest artwork to heaviest painting, without clogging.

60 different working combinations with this one airbrush give unlimited range of finishes. Operates on low or high pressure and volume of air. Priced no higher than ordinary spraying equipment.

AIRFINISHING FACTS

Summary of 63 time studies show average:

Savings 48.1%
Increased Production.318.93%
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THE remarkable savings with Paasche Airfinishing equipment over former methods shown in our advertising are not isolated cases . . the above savings are a summary of sixty-three such time studies.

Why not have a Paasche engineer give you complete details on how you can improve your present methods of finishing, without obligation? Valuable bulletins sent on request.

Pressure Feed Tanks, cover on and off in 15 seconds for 100 lbs. working pressure.

Airrubber—1600 hand strokes per min.

4 new Stripers, adaptable to every striping requirement.

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1921 Diversey Parkway, Chicago, Ill.

New York	Cleveland	Kansas City
Boston	Detroit	Minneapolis
Philadelphia	Milwaukee	Denver
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Cincinnati		Seattle

A. R. Williams Machinery Co., Toronto

LET FACTS AND FIGURES SHOW ADVANTAGES

IF 7 Gray

Latest Stains and Fillers for Wood Finishing

By
R. J. FAIRBURN

What some of the merits and possibilities of improved stains are, and how to successfully use them in connection with more economical and more rapid work schedules for high-quality finishing

MANUFACTURERS of finishing materials for use on cabinets or furniture, have made rapid strides in making possible faster production schedules. First came lacquers that could be applied at the rate of one or two coats a day; then varnishes were made to dry more quickly and still retain their good qualities, and now several manufacturers are marketing quicker-drying wood stains and paste wood fillers.

Features of Modern Stains

Attempts are being made to produce stains that will have the clear permanent tones of water stains but which will not cause the wood fibers to swell. This swelling, familiar to all users of water stains, is caused by the wood fibers taking up moisture from the stain, thereby swelling and producing a rough, uneven surface. This makes necessary a sanding operation to smooth the surface again. Many finishers apply a thin coat of shellac to hold the fibers upright so they can be more easily cut off with the sandpaper.

The object of these new stains, then, is to stain the wood without incurring these operations of shellacing and sanding. For the most part these new stains also dry to recoat in a few minutes time, as compared with the overnight dry required of former stains.

Tests of a number of these new stains show that some of them accomplish their purpose admirably. This is somewhat dependent, however, on conditions in individual finishing rooms. While these stains work well for one finisher and actually enable him to shorten his schedule one or two days, conditions in other finishing rooms are such that the stains are not all that may be desired. If, therefore, your experience is not entirely satisfactory, it is neither fair nor logical to condemn all such stains. Stain manufacturers are on the right path and eventually I believe they will make stains that will be satisfactory for all ordinary conditions.

Modern Paste Wood Fillers

Paste wood filler is applied to open-grained wood—usually following the staining operation—to fill the pores of the wood and prevent the wood from absorbing succeeding finishing coats. It is usually colored to approximate the shade of the finished piece so the filled pore will not be conspicuous.

Most wood fillers contain silex, which is a form of silica or sand. The particles of silex are irregular in shape with sharp edges that

NOW is the time
to test and try our—

2-hour RUBBING VARNISH

for you'll wish you had when you get back in production

This varnish dries dust free in 10 to 15 minutes and can be recoated in two hours *but it positively cannot be rubbed until next morning.*

You can maintain same production schedule as with lacquer at 50% less cost because this varnish has better body than lacquer . . . two coats being equal to three coats of lacquer.

Spray one coat . . . follow in two hours with second . . . rub the next morning. Its hardness is unusual considering its elasticity and it positively will not print.

We are also manufacturers of high grade lacquers but we particularly recommend this new varnish as something very unusual and different . . . truly a sensational product. Send for sample or trial order today.

Indianapolis Varnish Co.
131-147 NORTH PINE ST.
Indianapolis, Indiana.

cause it to stick into the pores of the wood and prevent the filler being pulled from the pores. Most fillers also contain a linseed oil binder that, in itself, would dry very slowly. To accelerate the drying, a dryer, similiar to that used in paint, is added.

Wiping the Filler

Filler is usually applied with a brush and then permitted to "ripen" or "flatten" on the work. It is then forced into the pores of the wood with a burlap pad. A rotary motion is used to insure each pore being filled, after which the excess filler is wiped off across the grain. The surface is still not entirely clear of filler and it is necessary to further wipe it off—this time wiping with the grain—with a clean cloth. Extra vigorous wiping is not recommended, as to use too much pressure might pull the still wet filler from the pores.

If the surface—that is, the space between the pores—is not wiped clean, the film of filler that remains will harden and have a murky appearance. On a finished piece this is known as "grayish cast."

Filler Drying

The type of paste wood filler that has been in use for many years and which is still used in most finishing rooms, does not thoroughly harden or dry until 24 to 48 hours after application. Some finishers take a chance and proceed with their finishing schedule, seemingly without difficulty, in much less time. This is not recommended by a majority of filler manufacturers, however, as a filler should be "bone dry" to insure a good finish.

By adding more dryer and altering the proportions of other ingredients, several filler manufacturers have succeeded in producing paste wood fillers that dry hard in a half day or less, and these are equal in every way to the slower-drying fillers. While a few finishers have stated that these quick-drying fillers do not work satisfactorily for them, there are few places where these fillers will not work satisfactorily, if they are handled properly.

Because they must be "bone dry" in three or four hours, these fillers "ripen" or "flatten" much more rapidly than the slow-drying fillers. This means, the filler must be wiped off within 15 or 20 minutes, after application. The wiping operation is not to be *started* in this time but is to be *finished* in this 15 or 20 minute period. Otherwise the filler will "set" and can not be wiped off clean—leaving a grayish cast on the work.

Regardless of the area of the surface being filled, a good job may be had if filler is applied to only as much surface as can be wiped off in time. It is not necessary to apply filler to the whole piece before wiping off. In shops where one man applies filler and others do the wiping, this system may still be followed by increasing the number of men on the wiping operation.

Success Attained

Using these quicker-drying stains and fillers requires a little care until the knack of handling them has been acquired. This was true of lacquers when they made their first appearance. It has been true of every other new development. If we have not acquired the knack, we should not be hasty to condemn the materials, as they really do work advantageously for many finishers.

It Has Proved—

INDUSTRIAL FINISHING
November, 1929
112
Stille's SPEE-D-DRY
The THIRTY MINUTE FILLER—
HERE is a wood filler that eliminates the slow spot in finishing departments. Wiped off in 3 minutes, dry and hard as flint in 30 minutes. You can move on to the primer coats. You can well appreciate the saving of time, labor and floor space through SPEE-D-DRY Filler application.
Given the acid test of time and use in industry through the past 18 months, SPEE-D-DRY Wood Filler comes to you as a thoroughly dependable product, guaranteed to do all we say—note our free trial offer.
SPEE-D-DRY Filler penetrates deep—est pores, will not pull out, does not raise grain, will not shrink or crack. It is furnished in any color, transparent and natural. The beauty of walnut, mahogany, oak and other woods is greatly enhanced.
Quicken your finishing process, step up your entire plant, advance your delivery dates—SPEE-D-DRY Filler will enable you to do
of the free trial
Stille's Free Trial Offer—Use sufficient of a 5-gal. can of SPEE-D-DRY Filler and Solvent to give it a thorough test. If it does not dry as hard as flint in 30 minutes, does not answer every demand of a quality filler, return unused portion and full credit will be allowed without quibble or question.
E. T. STILLE & CO.
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2343

Tremendously Successful—

STILLE'S Spee-D-Dry Wood Filler consumption has reached huge proportions because of its satisfactory working qualities, and if you haven't given it a trial — are not enjoying its many advantages — we urge you to investigate NOW. Our free trial offer makes it possible for you to give this material a thorough test in your own plant under your particular working conditions.

Our free trial offer affords the opportunity to test it thoroughly before buying . . . . . Ask us about it.

There is positively no tendency to bleed up through the finish, with a filler prepared such as Stille's Spee-D-Dry. It can be prepared in any depth of tone to arrive at exact color finishing on any open grain wood. Wipes easily, in from three to seven minutes, breaking perfectly as a wood filler should, allowing for good pore filling. There is no balking or raising in the pore, after the application of the prime coat.

But try it yourself—these and other advantages will effect tremendous savings in your finishing department, speed up production and establish a better finishing standard. Give it a trial at our expense.

E. T. STILLE & COMPANY

Main Office and Factory

2343 Greenview Ave. Chicago, Illinois

Southern Office and Factory, High Point, N. C.

Most manufacturers of stains and fillers will be glad to make a study of a finisher's problems and show how their finishes will work satisfactorily. The far-sighted finisher will avail himself of this service, thereby increasing his production and decreasing the storage space required for partly finished pieces.

Finishing Veneered Surfaces

If a veneered surface is poorly finished and if there is frequent variation of the moisture content in the atmosphere where the article is finally stored or placed in service, the wood will continually absorb and release moisture. Eventually, this may lead to warping and cause surface defects to develop.

In the finishing of veneered panels, it is important that both sides of the panels be given an equally good protective finish. Otherwise, the two sides will absorb atmospheric moisture at different rates, causing unequal expansion which sets up an internal stress. This is what usually occurs to make a panel warp.

Protecting the wood from external atmospheric influences is an important function of the finish. This responsibility is greater when the article is to be used where atmospheric conditions continually vary.

Another point with regard to finishing veneered surfaces is the importance of selecting a stain that will not react on the glue and cause discoloration and possibly weaken the glue joint. This is especially necessary where the face veneer is thin, as in such cases the stain easily reaches the glue. Proper choice of the stain will prevent any possible chemical reaction. Sometimes the glue works through to the surface of the pores of the wood and will prevent the proper penetration of the stain. If the surface is first carefully sponged with warm water, any glue in the surface pores will be removed.

Cross grained or curly grained veneer will absorb more stain than straight grained veneer and will therefore show up darker under the same stain—unless it is given special treatment. In order to prevent this, the cross grained wood should be moistened with water just before staining. This will prevent the stain from collecting excessively and penetrating too deeply at such places. The filler used should be worked well into the wood grain, especially when filling woods that readily absorb stain.

It is often a good plan to use oil stains on thin veneer in order to avoid loosening the glue. With ordinary water stains, there may be trouble with the grain raising although some finishers prevent this by first adding a very little glycerine to the stain.—W. E. Warner.

Wallace Heads Paasche's Boston Branch

Paasche Airbrush Co., 1921 Diversey Pkwy., Chicago, announces that Mr. Ray H. Wallace has been appointed New England Manager of this company, with offices in Boston, located at 126 High St., phone Liberty 4763.

New Crystallizing Lacquer

John L. Armitage & Co., Newark, N.J., announces that: "A crystallizing lacquer has been developed by this company that may be dipped or sprayed on glass surfaces direct, without first applying a primary or bond coating. Test panels (of glass) thus coated over a year ago, show perfect adhesion and durability."

The Trend Toward
EARLY AMERICAN

The prominence and increased space in Department and Furniture Stores given to reproduction pieces and suites of Early American Furniture indicates a marked trend toward this charming style.

This is even more strongly emphasized by the growing demand on the part of buyers, especially for reproduction of Old New England furniture in Cherry, Maple, Birch, Pine, Oak and Mahogany.

When contemplating the addition of this type to your line, whether it be a single piece or a full suite, the importance of correct color, accuracy of style and effect of finish cannot be too carefully considered. The color and finish will to a very great extent determine success.

It is part of our service to give authentic information, to provide complete working directions and to finish specimen pieces.

For many years we have extended this service and have furnished Stains, Fillers, Lacquers and Varnishes to the foremost factories, especially in New England and other Eastern states, in most instances matching the finish directly from the original.

Therefore we suggest, that if you contemplate bringing out a suite or individual piece to meet the coming demand for Early American Furniture you permit us to work out the finishing problem with you.

Send us a small piece or, perhaps, a case front and let us finish it in the correct color and approved finish. You assume absolutely no obligation whatsoever.

Should it then become our privilege to supply the necessary materials you may depend upon satisfactory results, for our Wood-finishing Products are in daily use in thousands of finishing rooms, giving dependable and lasting finishes, abreast with the times and produced in the quickest time and with the greatest economy in finishing cost.

THE GILBERT SPRUANCE CO.

RICHMOND AND TIOGA STS.

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Finishing Good Furniture On A One Day Schedule

By
H. R. ANDERSON*

Employing modern rapid-drying, non-grain-raising materials, it is possible to put on a satisfactory finish complete in one day, the finish to include stain, filler, sanding sealer and two or three coats of lacquer

ONLY A FEW years ago a quick finish was invariably considered to be a poor finish, and it must be admitted that there was plenty of ground for this assumption. Only the cheapest furniture received what was then called "a quick finish," and the cheap, quick finish of that day required more time to dry at each step in the process, than the satisfactory, quick finish of today.

The contrast between finishing methods of a few years ago and those of today is remarkable. Now the quick finish placed on high-grade furniture is so much better in quality than anything the old-time finisher even dreamed about, that the improvement is almost unbelievable. The best furniture of today is finished three times as quickly as the cheap furniture of yesterday.

New stains on the market have made such a great advance in finishing that "revolutionary" is the only word adequate to describe their effect. Former stains, made with colors dissolved in water, invariably raised the grain to a point that made considerable sandpapering necessary. Not only the sandpapering constituted a serious drawback, but a skilled operator was required to do this job successfully.

Anyone who has attempted such sanding knows how easy it is to sand through edges and corners, making an effect that is not easily corrected. It is true that much sanding was left until after the shellac or sealer coat, but this did not lessen the labor involved to any great extent. On the highest grades of furniture it was customary to first sponge the wood with warm water, let dry and sand before even applying the stain—this to get away from sanding so much after the stain had been applied.

Imagine, if you can, a liquid stain made from water-soluble, non-fading aniline colors, completely dissolved in a liquid that contains no water. By using water-soluble colors the stain manufacturers se-

Manufacturers of automobiles led the way to the quick finish. Millions of exhibits are on the streets every day as evidence of their great success in developing quick finishes that are not only as fine as modern chemistry can make them, but many times more durable than the old-fashioned slow finishes they replace.

*With James B. Day & Co., Chicago.

What ARE your Finishing Problems?

Tell us about them - - won't you? And let us see if we can help you. Out here in Rockford we maintain an art studio, staffed by experts whose sole interest lies in solving finishing difficulties. Clients report gratifying results from new finishes, new tones and new color combinations, that these artists have created. They can do the same for you if you'll just give them a chance. Studio service is free to manufacturers - - and involves no obligation.

The
ROCKFORD VARNISH
Company
ROCKFORD, ILL.

cure the essential feature of fastness to light. The new stain, by utilizing a non-aqueous solvent, does away with all grain raising; and equally important, it speeds up the staining operation to a point that seems the minimum in time.

The stains referred to dry thoroughly in anywhere from ten minutes to an hour, depending on the amount of color in the stain. The lighter tints dry more rapidly. Thus the first operation of finishing — staining —saves the overnight drying of the sponging coat of water, plus the additional overnight drying required for safe recoating of a water stain, and all of the sanding involved. No sanding whatever is required over the new stain. Thus the use of a new stain cuts at least a day from the total finishing time.

These savings are based on a comparison with the finishing procedure on high-grade lines. A good saving, however, may also be effected on lower-priced furniture through the quick drying of the stain and a tendency to uniform the surface.

The next finishing material in the ordinary course of wood finishing is filler, and almost as great advance has been made in the manufacture of this product. From fillers that take overnight to dry, to fillers that dry to recoat in only three hours is a big jump. What it really means is that furniture manufacturers can speed up their finishing schedules to complete in the same day, every article they start in the morning. There is apparently no sacrifice in working qualities, rubbing or durability in speeding up the drying of the filler to this point.

Fillers that dry in less time than three hours have been found to set so rapidly that the proper wiping cannot be successfully performed, and there is likely to be too little binder to hold the filler together permanently. For the present three hours seems to be the safe limit. Although no one can predict what the future will bring in the line of quick-drying fillers, it seems probable that, unless radical changes are made in the basic formulas, there is not likely to be much further improvement along these lines.

The advent of nitrocellulose lacquers, of course, opened the door to quick finishes. Remarkable progress has been made in such finishing materials during the past few years. Limitations that at first circumscribed the use of lacquer are rapidly being abolished and apparently will soon be so completely eliminated that the finisher will have no need to depend on slow-drying finishes for any purpose.

Over the filler a sealer of some sort is generally used with the triple purpose of (1) sealing the stain and filler to such an extent that following coats will not affect them, (2) to prevent any slight bleeding of filler or stain colors into the lacquer, and (3) to provide additional body for the complete finish.

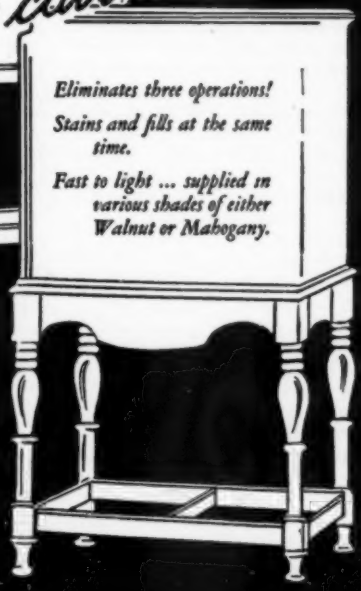
Formerly the types of sealers or first coaters used were made either on a spirit base or on an oil base, the vastly greater proportion being made with spirit soluble gums in an alcohol solution—with the possible addition of smaller quantities of other ingredients. These materials served very well under varnish and have continued to be used to some extent under lacquer,

Our new Combination Uniforming Stain has revolutionized finishing of radio cabinets —

Eliminates three operations!

Stains and fills at the same time.

Fast to light ... supplied in various shades of either Walnut or Mahogany.



While this Combination Stain and Filler is being used by many of the world's largest manufacturers of radio cabinets, its use is by no means restricted to radio cabinets—it can be used on furniture, fixtures, and many other products.

Write today and let us tell you more about this sensational product . . . and also about the complete process that is being used with this stain.

INDIANAPOLIS PAINT & COLOR CO.

INDIANAPOLIS, INDIANA.

although their use has been steadily diminishing over a period of years.

The modern finishing material for this purpose is called a "sanding sealer," and is all that its name implies. It is made on a pyroxylin base and knits in with the finishing coats, making in effect one solid coating of pyroxylin base materials over the stain and filler. It seals the new type of stains and fillers completely, and works equally well over modern stains and fillers of other types. Incidentally, the old type of spirit first coater does not always work well over the quick-drying stain and filler.

Sanding sealer, although it does not form as thick a film as spirit first-coaters, has other advantages that more than make up for this drawback.

Sanding sealer raises the grain of the wood very little. In comparison to the degree spirit first-coaters raise the grain, there is a very marked difference. In fact, if the wood is sanded carefully, it is often unnecessary to sand the sealer at all. Fiber and cardboard take a smooth finish without sanding, when given a first coat of sanding sealer. What sanding is necessary on wood may be accomplished very quickly by unskilled help, because the sanding sealer sands freely without gumming the sandpaper. The ease of sanding makes sanding through edges and corners a very rare occurrence.

There is such a wide variation in the qualities different furniture manufacturers look for in a finishing lacquer that it is hard to treat such a general subject in a few words.

There are many new developments in this field that are not yet generally known, and which require explanation. The older lacquers were not of a very good body unless loaded up with gums. The addition of a large proportion of gums tended to make the heavier-bodied lacquer less tough and durable, although in effect more like a varnish in the type of film they produced.

Modern lacquer chemistry has given us lacquers with heavier body, and which still have a satisfactory degree of toughness and durability. Clear lacquer may be made hard or soft, thick or thin, colorless or dark. The use for which it is intended determines the qualities built into it.

Hundreds of lacquers are available for as many purposes. Tough, durable lacquers for such surfaces as table tops; heavy-bodied lacquers where only two coats or so are required to produce a substantial body; rubbed-effect lacquers obtainable in any degree of flatness from an egg-shell sheen to dead flat; nitrocellulose sealers that, instead of raising the grain, have a tendency to flatten the grain and so make sandpapering easier and quicker; lacquers for application by brushing, spraying, dipping, squeegee or tumbling.

The present tendency is toward clear lacquer of heavier body. Such a lacquer rubs and polishes to a brilliant luster, and helps to secure a complete finish in a day because it bodies up sufficiently to build a full-bodied finish in two coats over sealer.

Over the gloss lacquer, many manufacturers prefer to use a coat of flat lacquer. Flat lacquers may be made much more uniform than in former days, although lacquers

ADVERTISING PAGES REMOVED

made flat by the same process as the old flat varnishes still evidence the same trouble of non-uniformity. Otherwise, flat lacquers may have all the qualities obtainable in gloss lacquers.

For the first time in the history of the finishing industry, it is possible to produce a truly high-grade finish, applying all of the materials in one day.

The procedure on walnut, mahogany, oak and all open-pore woods consists of applying stain, filler, sanding sealer, one or two coats of gloss-body lacquer, and a coat of flat lacquer if desired. All of these materials may be applied in one day, after which the furniture can be rubbed if desired, wrapped, crated and shipped the next day. On woods that are to receive an open-pore finish, or on tupelo, birch or maple, the necessity for filling does not exist, therefore furniture made of these pieces may be completely finished in little more than half a day.

Just stop and think what this new finish means to the furniture industry. It places furniture finishing on a basis where a greater emphasis is placed on time than ever before. It means that a piece can progress from one end of the plant to the other, starting unfinished, and ending up at the packing room ready for shipment in less time and consequently with a smaller investment of capital.

If this quick finish resulted only in a saving of time and required a sacrifice in quality, its advisability would be open to argument. But under the circumstances, when a high-grade finish is assured, together with the great saving in time and labor, it seems obvious that the one-day finish will increase in popularity by leaps and bounds.

The successful manufacturer today, is the one who has abandoned old manufacturing theories.

Find out just what is wanted, and then produce a product which will fill that particular want.

Gilbert Spruance Builds Addition to Plant

The Gilbert Spruance Co., Richmond & Tioga Sts., Philadelphia, Pa., announces that "an extensive addition is being made to the buildings of the lacquer department of the Philadelphia plant. The new building is to be of fireproof construction, and the most modern machinery and up-to-date devices for the manufacture of lacquers and spirit products will be installed. Facilities for the manufacture of lacquers will enable the output to be increased from five to six times the present capacity."

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For All Defects in Wood

Manufacturers in all wood-using industries find SAN-ITAI-RIE FILLER unsurpassed in filling cracks, worm holes, knot holes, open joints, dents, pitch pockets, etc., and through its use are able to send out their products without a flaw.

Put up in friction top cans—half pints to gallons—in 20 different colors. Send for sample can.

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164-170 W. Kinzie St. G. J. Liebich Co. **Chicago, Ill.**

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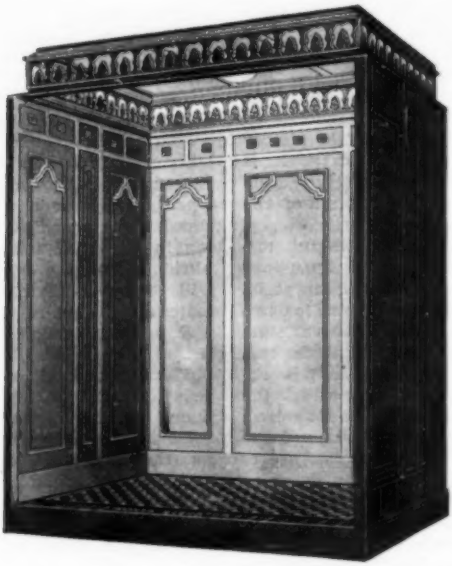

How We Finish Elevator Cabs

By
H. M. HAGY

Foreman Finisher of Warner Elevator Mfg. Co., Cincinnati, explains and illustrates how passenger elevator cabs are stipple finished in gold over brown—with special reference to metal cleaning, putty glazing, sanding and bake-finishing operations

DO YOU REMEMBER just a few years ago, the elevator cab built with a solid metal wainscot about 4-ft. high and with the rest of the side walls and ceiling of iron grille? The entire cab, inside and out, was finished in black. But styles have changed. With the passing of the cage came paneled walls, solid ceiling and a demand for new and attractive finishes for cab interiors.

There are many excellent finishes that are adapted to cab interiors; however some care must be exercised in the selection of a suitable finish. One requirement is that it be smooth. Another is that the finish should readily lend itself to use on comparatively large plain surfaces. Often a finish applied to a small sample piece of metal, say 2 x 3-in., will have a pleasing appearance but the same

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All the advantages and economies of high temperatures for drying and baking—with absolute SAFETY positively insured. Proper automatic control as provided by the Nichols method, makes possible the savings from speedier finishing—with safety. To insure BOTH, specify Nichols-McCann-Harrison Heaters. Approved by the Underwriters Laboratories. Write for descriptive bulletins and performance data.

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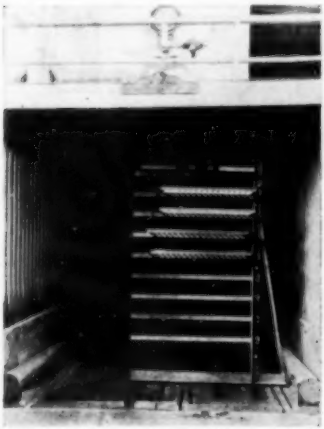


Interior of oven where finish is baked.

finish on a cab interior, where the plain broad surfaces can be relieved only with a panel effect moulding, is not so attractive.

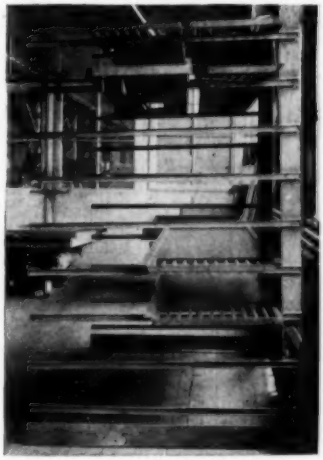
In this article, I have selected the stipple finish in gold over brown for explanation because this finish, in its several possible combinations, forms a cheerful, attractive and durable finish for the interior of the modern elevator cab.

Of course, the cab comes to the finishing room "knocked down." The first operation is to hand clean all metal parts with gasoline and then sand the rough spots with No. ½ emery cloth. The panels are then carefully inspected and any remaining rough spots are glazed with putty. A putty, made of dry white lead and shellac mixed to the proper consistency, is applied to the parts with a flexible knife and allowed to dry from ½ to ¾ hours, after which the surface is dry sanded, using No. 0 sandpaper.

All of the parts are then taken to the spray booth where a coat of oil primer (in maroon color) is applied. Parts are then placed in the oven where the prime coat is baked for two hours at 400° F. When cool, all primed surfaces are dry sanded, using No. 3/0 sandpaper. After the surfaces have been wiped and blown clean, a spray coat of brown baking enamel is applied. This coat is baked in the oven for two hours at 175° F.

When the cab parts have cooled sufficiently, they are returned to the booth where the gold is misted on the brown color coat. A special spray gun, equipped with a regulating attachment which controls the size of the gold spots or stipples is used to apply this coat. We use 4-oz. of pure, metal-leaf, pale gold to 1-qt. of bronzing liquid, adding lacquer thinner to reduce the mixture to the proper consistency; the bronzing liquid, used full strength, is too heavy a

Close-up of rack upon which finished parts are laid immediately after finish is applied and on which they remain during the baking operation.



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For Use With Any Standard Compressor

Price of Outfit Complete **$47.50**

Presto Model 155 with direct connected compressor and electric motor mounted on a portable steel truck. Gives perfect atomization and high speed application of either light or heavy materials. Price complete, as shown above, $142.50. No accessories to buy.

NEW The Presto Model 95-OC has been developed to provide industrials with a thoroughly dependable, compact and efficient Spray Finishing Outfit at a price lower than ordinarily quoted on Commercial Equipment of this kind. It is distinctly a precision outfit — for production work in woodenware, metalware, furniture and other manufacturing plants from Toys to Machinery. The Presto Model 95-OC is complete with quart clamp-on container, pressure regulator and gauge, air conditioning unit, and 25 feet of rubber air hose.

Metal Specialties Mfg. Co.

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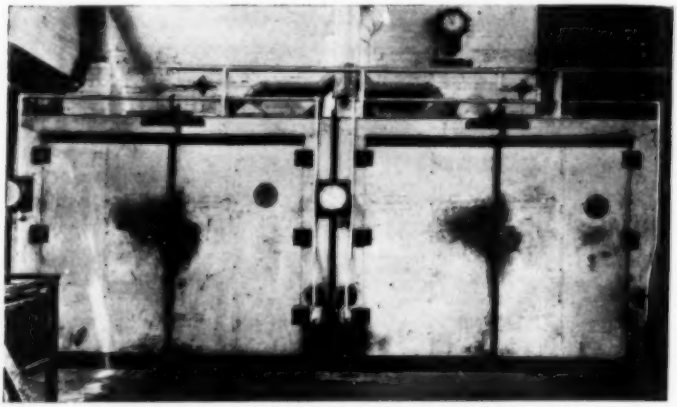

Front view of two ovens into which loaded racks of freshly finished parts are placed.

vehicle. Of course, a little experimenting is necessary to determine the exact quantity of thinner to add, and by this means we establish a table of standards which will work satisfactorily for the various size spots or stipples.

This stipple coat is thoroughly dry in 15 to 30 minutes; then the parts are given a spray coat of baking varnish and are placed in the oven where they remain for two hours at 180° F. When cool, the varnish coat is dry sanded, using No. 3/0 sandpaper. Following the usual cleaning after sanding, a second coat of baking varnish is sprayed on, and the parts are baked for the same length of time at the same temperature as the first varnish coat.

If the specifications call for a satin finish, the surfaces are rubbed with pumice and oil. If a gloss finish is desired, they are rubbed with pumice and water. After rubbing, all parts are wiped clean and polished by hand, using a polishing compound for this purpose.

A cab interior, unlike the paneled walls in your home or office, is subjected to hard wear continuously, hence it must be given suitable protective coatings to insure durability of the finished surface. The real test is actual service, and this finish has proved its lasting qualities as well as being permanently attractive.

Lecture Course Published on Paint, Varnish & Lacquer

A course of lectures, given before The Paint and Varnish Superintendents' Club of the Philadelphia District, has been reported, mimeographed and bound and is now offered for sale in this convenient form. Speakers were selected by this Club on the basis of what definite information they could give on the scheduled subjects. The lectures were given during the period of October 29, 1929, to April 22, 1930.

This course, which is in the nature of a text or reference book on paint, varnish and lacquer materials, also takes up problems common to executives in the industry. It has been reported by the Adelphia Reporting Bureau, Hotel Adelphia, Philadelphia, Pa., and is bound in a blue fabrikoid, loose-leaf binder and lettered in gold. The book contains 357 pages, size 8½x11-in., and is tab indexed by subject for ready reference.

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Or Other Cabinet Work

W-Seal Brevolite

Seals in stain and holds grain down so there is a minimum of sanding.

32-M Clear Wood Lacquer Brevolite

More body and depth than most wood lacquers. Rubs with a minimum of effort.

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8 A. M. — One Coat W-Seal
11 A. M. — First Coat 32-M
3 P. M. — Second Coat 32-M
Next Morning — Rub

Let these two friends help to shorten your finishing schedule

Brevolite Lacquer Company
(Formerly Waukegan Chemical Company)
NORTH CHICAGO, ILLINOIS

"Values That Endure"

Temperature Control for Ovens

The application of dependable temperature-controlling devices to industrial appliances such as baking ovens, drykilns, etc., often amounts to a considerable item during the period of a year. In many cases the aggregate savings are sufficient to amortize the cost of the instrument and its installation within a short time, and the device proves to be very profitable investment.

Automatic temperature controllers can be installed with the assurance that the firm will secure:

A reduction in heating cost by preventing excess temperatures.

Lower labor cost, by making it unnecessary for an employe to constantly watch the temperatures.

A saving of material by preventing damage and loss caused by using or permitting incorrect temperatures. Often it is possible to damage or destroy much valuable material within a few hours. Dependable temperature controllers insure the user against losses caused by variations in temperatures.—*Industrial Gas.*

Duplicating Machines In Enamel Finish

Nearly all of the parts on the Gestetner Duplicator* that are not plated are finished in a hard, durable enamel. There are two different finishes—a bright finish and a crackle finish. The bright finish is used on most of the castings and the crackle finish is used more on the sheet metal parts. Three ovens are employed for baking this enamel, which is sprayed on by special spray guns. The ovens are of the truck-loading type and are large enough to handle heavy loads of wet material. By careful control of temperature, time and atmosphere, the different finishes desired are obtained.

To get the bright hard finish effect, the finish is baked at a temperature of 3500° F. for an hour.

The crackle finish is obtained by spraying on a special lacquer and allowing it to soak in a foul atmosphere for some time before the regular oven bake is started. The foul atmosphere is produced by burning a small jet of gas in the oven while all fresh air is excluded. When the regular oven bake is started, the large burners are turned on and the foul vapors are exhausted through the flue.

Japanned parts are all given three or four coats of enamel before the fine finish so necessary to the final appearance of the machine is obtained—Excerpts from "The Versatility of Gas," published in a recent issue of *Industrial Gas.*

* Gestetner Duplicator Corp., Bloomfield, N. J., plant.

Lacquer Blushing

Blushing is due chiefly to weather conditions—usually excessive humidity—although sometimes it may be caused by using improper lacquer materials. The temperature of the spray room should be maintained at about 70° F., with the wet bulb thermometer reading not over 62° F. It is important to guard against cold-air drafts which may enter from the exhaust shaft. Spraying with the air pressure too high sometimes causes blushing.—W. E. Warner.

The day is gone when a manufacturer can make what he is best equipped to make and then go out and attempt to find a market for it.

The Modern Way to Prevent Fire Tie-ups

Lux smothers fire with carbon dioxide, a harmless, non-poisonous gas.

LUX

DRY—HARMLESS FIRE EXTINGUISHERS

FIRE does more than burn. Fire holds up work, disrupts production schedules and delays deliveries. Its aftermaths often cost more than its destruction.

But with the right kind of extinguisher, fire can be put out without expensive tie-ups. That is the modern way.

When the Lux Extinguisher is used, there is no mess of chemicals or water to be cleaned up. Varnish, lacquer and paint are left uncontaminated and ready for use again. Finishing starts as soon as the flames are out.

The Lux extinguishing agent is carbon dioxide, a heavy, clean, dry gas.

Lux is available in hand and wheeled extinguishers suitable for use in finishing rooms. Over 50,000 units are in service today, not only because they kill fire, but because they prevent the costly losses that follow fire.

Write for a free copy of "Fire Extinguished—Without Trace."

Walter Kidde & Company, Inc.
140 Cedar Street
New York

Color Mixtures for Various Tints, Shades and Hues

In past articles I have considered colors used in tinting, and their meanings. I will now take up various colors and their mixtures. These results are based on the use of good quality colors in oil. Different brands used will vary from these as all makes, good and bad, will make different casts in the tints, shades, tones and hues.

Athenia

White	(parts) 32
Indian red	1
Burnt sienna	(touch of)

Autumn Brown

White	21
Burnt umber	1
Burnt sienna	½

Azure Blue

White	18
Cobalt blue	1
Prussian blue	(touch of)

Ashes of Roses

White	24
Rose lake	1
Raw sienna	½

Anemone

White	37
Tuscan red	1
Cobalt blue	(touch of)

Apple Green

White	96
Sylvan green	4

Antrim Green

White	100
Medium green	3
Medium chrome yellow	4

Apricot

White	28
Deep or orange chrome yellow	1

Argent

White	16
Lamp black	9
Deep orange chrome	(touch of)

Armada

White	3
Burnt umber	2
Medium chrome yellow	(touch of)

Almond

White	3
Raw sienna	1

Alice Blue

White	10
Cobalt blue	1
(or, if you prefer)	
White	20
Ultramarine blue	1

Almond Green

White	75
Medium green	9
Venetian red	2

Amber

Burnt Umber	5
Medium chrome yellow	9
Orange chrome yellow	8

American Beauty Rose

American vermilion	13
Rose lake	2

Amethyst

White	16
Rose lake	1
Prussian blue	¼

Brown Pink

White	42
Light chrome yellow	1
Raw sienna	1

Burnt Orange

Orange chrome	20
Raw sienna	1

Brown Ochre

Raw sienna	6
Burnt sienna	1

Burgundy

Rose lake	5
Ultramarine blue	1
White	2

Butter Cup

White	19
Light chrome yellow	1
Medium chrome yellow	1

Brick Dust

White	3
Venetian red	1

Brittany Blue

White	56
Prussian blue	1
Indian red	(touch of)

Bronze

Burnt sienna	1
Light chrome yellow	2
Raw umber	3

Bronze Gray

White	28
Raw umber	1
Light chrome yellow	1

Bronze Green

Burnt umber	3
Light chrome green	12
Light chrome yellow	8

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[Industrial Tape]

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*Company*_____

*Street and Number*_____

*City*_____ *State*_____

Kindly mention INDUSTRIAL FINISHING when writing advertisers

Bottle Green

Dark chrome green	8
Lamp black	1

Brass Yellow

White	40
Light chrome yellow	12
Raw umber	1
Burnt umber	1

Brewster Green

Dark chrome green	8
Lamp black	3

Briar Rose

White	64
Tuscan red	1
American vermilion	(touch of)

Blue Lotus

White	60
Ultramarine blue	16
Indian red	1

Bluat

White	4
Cobalt blue	1
Mauve	(touch of)

Blue Spruce

White	11
Dark chrome green	1

Bluish Pink

White	86
Burnt sienna	1
Raw sienna	2
Tuscan red	(touch of)

Bois De Rose

White	102
Raw sienna	1
Indian red	1

Bonnie Blue

White	1
Prussian blue	1
Mauve	(touch of)

Bedford Stone

White	100
Raw sienna	3
Lampblack	(touch of)

Begonia Red

White	44
Mauve	3
American vermilion	(touch of)

Buff

White	80
French ochre	20

Beige

Whites	74
Burnt umber	2
Van Dyke brown	1

Bermuda Pink

White	54
American vermilion	5
Deep orange chrome yellow	2

Baby Blue

White with a touch of Prussian blue

Battleship Gray

White	128
Raw umber	2
Lamp black	1

Beach Gray

White	34
Raw umber	1

Bisque

White	74
Raw umber	1
Raw sienna	4

Bitter Sweet

Deep orange chrome yellow	6
American vermilion	5

Beaver Brown

White	14
Burnt umber	4
Medium chrome yellow	(touch of)

Cocoa

White	115
Burnt umber	25
Indian red	2

Copper Brown

White	8
Raw sienna	2
Burnt sienna	1

Corn Color

White	100
Medium chrome yellow	2
Raw sienna	1

Coach Brown

White	74
Raw sienna	28
Burnt umber	4
Burnt sienna	1

Copenhagen Blue

White	30
Tuscan red	1
Prussian blue	2

Chocolate Brown

White	100
Raw sienna	12
Burnt umber	22
Burnt sienna	12

Champagne

White	156
Raw sienna	8
Light chrome yellow	2

Cocoa Nut Brown

White	1
Raw sienna	1
Burnt umber	4

Ciel Blue

White	300
Prussian blue	1

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TO tell you "long distance" our lacquer thinner story is no mean task.

And so we have prepared a rather inspiring and comprehensive brochure entitled "11 Lacquer Thinner Problems" and how we helped solve them.

We promise you some interesting, enlightening, profitable reading if you'll request a copy. Yes, we have a selfish motive—to unfold via actual case records the true character of our facilities and personnel which protect the Val-U-Lac Thinner name on every drum and tank car.

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Will yours be the next copy?

Pierce & Stevens, Inc.

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Industrial Lacquers and Lacquer Thinners

721 Ohio Street **Buffalo, N. Y.**

P&S #5

China Rose

White 26
Indian red 1
Tuscan red 4

China Pink

White 130
American vermilion 1
Tuscan red 4
Indian red 1

Chamois

White 100
French ochre 3
(Sometimes a touch of burnt sienna is needed)

Chartreuse Green

White 134
Medium chrome green..... 5
Medium chrome yellow..... 4

Cherry Red

American vermilion 3
Alizarin crimson 3

Chestnut

White 28
Burnt umber 8
Tuscan red 1

Chin Chin Blue

White 40
Prussian blue 2
Tuscan red 1

Clay

White 52
Raw sienna 2
Raw umber 1

Clematis

White 102
Cobalt blue 3
Mauve 1

Cleopatra Blue

White 50
Prussian blue 1
Cobalt blue 8

Cinder Gray

White 64
Van Dyke Brown..... 3
Burnt umber 1

Citron Yellow

White 52
Light chrome yellow..... 48
Medium chrome green..... 1

Claret

Mauve 1
American vermilion 1

Celestial Blue

White 33
Prussian blue 1

Ceramic Blue

White 18
Prussian blue 1
Light chrome yellow.....(touch of)

Cerise

White 6
American vermilion 1

Cevera

White 3
American vermilion 1
Mauve 1

Cigar

White 4
American scarlet vermilion..... 1
Burnt umber 3
Deep chrome yellow..... 1

Carrot

White 2
American scarlet vermilion..... 1
Deep orange chrome 4

Castor

White 5
Van Dyke brown..... 1
Burnt umber 1

Cedar

White 114
Medium chrome yellow..... 3
Burnt umber 2
Burnt sienna 3

Cedar Brown

White 2
Burnt sienna 2
Burnt umber 1
Medium chrome yellow..... 1

Cetrine

White 75
French ochre 15
Burnt sienna 4
Drop black 6

Cream

White 98
French ochre 1½
Lemon chrome yellow..... ½

Carnation Red

White 4
Scarlet vermilion 7

Carnation Rose

White 7
American vermilion 1

Coffee

White 10
Burnt umber 3

Coral

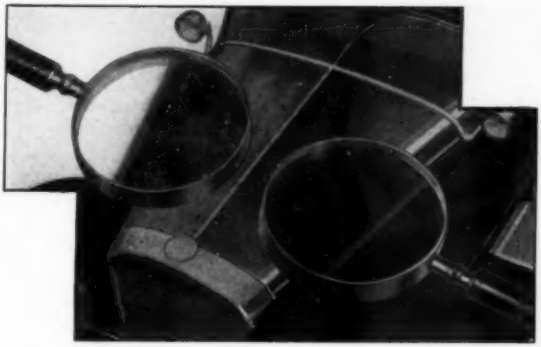
White 23
American vermilion 6
Medium chrome yellow..... 1

Coverst

White 68
Raw umber 5
Light chrome green..... 2

Canary Yellow

White 66
Light chrome yellow 9
Medium chrome yellow....(touch of)



This Test Proves No Other Finish Can Equal Rezyl Endurance - - - - - - -

The Sun, the Rain, and the Dust were called upon to decide which finish was better for automobiles. Half of the hood was finished with a Rezyl automotive lacquer—the balance of the body was finished with an ordinary automotive lacquer. Months of exposure in a southern climate scarcely touched the Rezyl lacquer finish shown magnified at the right of the illustration—there is no cracking . . . no checking . . . no chalking.

Rezyls have other advantages entirely aside from their durability. They are true solvents of nitrocellulose; in all proportions they are compatible with this ingredient and reduce the amount required in either clear or pigmented Lacquers.

The excellent results obtained with Rezyls by leading makers of Lacquers show that such Lacquers are without an equal for indoor or outdoor use on wood and metal.

You can determine for yourself the exceptional worth of Rezyls. Just fill and mail the attached coupon and full information will be sent promptly. At the same time, if you desire, we will tell you about our other synthetic ingredients for Lacquers: Rezyl Balsams for plasticizing; Ethyl Lactate, the high-boiling solvent; and Teglac for furniture Lacquers.

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Please send me full information on Rezyls-Rezyl Balsams-Teglac - Ethyl Lactate, for the following applications:

- ☐ Sanding Sealer ☐ High Gloss Furniture Lacquer
- ☐ Clear Lacquer for wood or metal
- ☐ Pigmented Lacquer for wood or metal
- ☐ Special Purpose (explain) .....

Name .....
Address .....
Mark for attention of .....
My Lacquer Supplier is .....

Caramel

White	7
Burnt umber	2

Cardinal

Alizarin crimson	3
American vermilion	1

Colonial Yellow

White	95
French ochre	3
Lemon chrome yellow	2

Cafe Creme

White	70
Van Dyke brown	1
Raw sienna	2

Cafe-Au-Lait

White	42
Van Dyke brown	1
Raw sienna	2

Camel

White	52
Raw umber	2
Raw sienna	1

Camella

White	17
Raw sienna	1

Cameo Pink

White	48
American scarlet vermilion	1

Crane Gray

White	400
Prussian blue	1
Lamp black	1

Cream

White	42
Raw sienna	1

Creme Moda

White	70
Van Dyke brown	1
Raw sienna	2

Cornflower Blue

White	124
Tuscan red	1
Prussian blue	1

Crab Apple

White	102
American scarlet vermilion	1
Medium chrome yellow...(touch of)	

Cranberry

American scarlet vermilion	5
Mauve	1

Creole Brown

White	34
Venetian red	2
Van Dyke brown	2
Raw sienna	1

Crystal

White	200
Van Dyke brown	4
Prussian blue	1

Cycolmen

White	25
Mauve	1
American vermilion	1

Uniforming, Highlighting Walnut, Gum, Willow, Maple

In the wood finishing field today, finishers have at hand various methods and effects, especially dealing with walnut and the several kinds of wood that can be successfully prepared to harmonize with this very popular cabinet material.

In this article I will deal with the finishing of a moderately-priced radio cabinet, sewing machine cabinet or similar cabinet, which might embody say three or four different kinds of wood, namely, walnut, gum, and willow built up with maple overlay and perhaps fancy-figured fronts or panels.

It is reasonable to assume that about the first thing to be considered is the cost, which must be kept down. The finisher who can produce a substantial effect that "looks like a million dollars" and "costs about a $1.98" so to speak, is the man who keeps the competitor from looking backwards.

In developing a finish for the above mentioned cabinets, I first apply a base sealer or bleacher, this being a very thin spirit material barely tinted with spirit colors to the desired shade, thus producing a uniform background "creating light and richness." This application serves at the same time as an instant sealer, preventing too much absorption of colors by the softer lumber; it can be either brushed or sprayed on, care being taken to avoid putting it on too heavy so as to interfere with the penetration of further applications. This base can

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Elizabeth New Jersey

be obtained from practically any good stain and filler manufacturer.

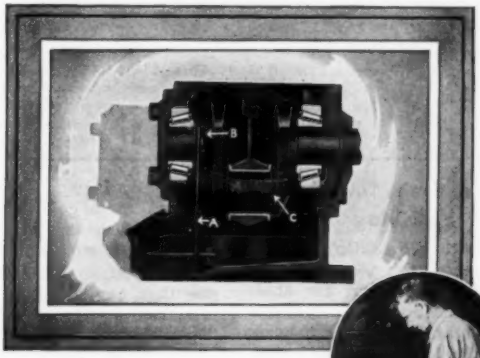
After allowing this base sealer to dry one hour (it does not require sanding) I next apply a pigmented or uniforming oil stain of desired shade, allowing a reasonable time for this to set up or "flat;" it is then "ragged off" much the same as ordinary filler, taking care to avoid rubbing too hard on the more stubborn areas.

I might add that if a filled pore is desired, these stains will carry some 3 or 4-lbs. of silex without interfering with their working qualities. They are composed of non-bleeding colors, and with this process I have never experienced any streaks or splotches coming through.

On the overlays and gum turnings, where a highlighted effect might be desired, the uniforming oil stain is omitted and a lacquer shading stain may be used over the base sealer or bleacher to obtain the desired effect. The figured and matched veneers are simply filled with a transparent filler, affording a very rich golden cast.

The most popular follow-up process, when these materials dry over night, is to apply a coat of lacquer primer, sand smooth and follow with one or more coats of clear lacquer. As a result, the finished product takes on a decidedly pleasing and attractive appearance, and it really has a very economical and reliable finish.—James McFadden.

Many important changes are taking place within the entire finishing material industry. Therefore, unless one keeps in constant touch with the various details involved he cannot expect to accomplish much in the way of progress.



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In the Curtis Centro-Ring System, a ring (A) lifts oil to undercut groove (B) in crankshaft. Centrifugal force carries it through ducts in chamber (C) in crankshaft. Then a centrifugal force redistributes it to ribs in the crankshaft which lead the oil to each friction point.

Also there is the Curtis Suction Valve Type Unloader which avoids oil pumping due to vacuum. It operates on the suction valve. When machine is unloaded, valves do not operate as with a suction port unloader.

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Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer any further comments or recommendations pertinent to subjects mentioned

Walnut Stain for Chair Finishing

Relative to E.F.&S.Co's request in May issue, page 66, asking for an oil stain in walnut for chair finishing, there are a number of such stains on the market today, many of them being advertised in INDUSTRIAL FINISHING. However, I would prefer to use one of the penetrating stains on these chairs. These stains will not raise the grain at all. In my opinion, the present day 30-minute stain* has every advantage over the old stain. I have found it to be non-grain-raising and quick drying, and its use accelerates production.—J. K. Cooper.

Painting and Lettering Metal Trucks

I am to paint 30 metal trucks and I presume the finish will be bright red enamel. This will be a regular paint job. What method of procedure would you advise to make a good job of them? These cars will be lettered in gold . . . black shading and white stripes. —J. W. C.

To obtain a first class paint job on an automobile body, the most modern method of painting is done with the assistance of the spray gun, which is a great saver of labor and time. When repainting old metal-covered bodies, it is first necessary to remove the paint, while with new bodies the only precaution necessary is to see that the steel is clean and free from grease and oils.

For removing old paint there are a number of excellent varnish and paint removers on the market. All of these varnish removers contain a certain amount of wax, and it is essential that all of the varnish remover be washed off the body before any paint is applied, or the drying rate will be greatly retarded. High-test gasoline is a good solvent for these waxes.

After using the varnish remover, should any paint remain on the surface, it is well to burn this off with a blow torch. The body surface is now thoroughly clean and free from old paint, oils, greases and wax.

The first coat of paint to be sprayed is enamel undercoat. This material has an excellent tooth and adheres very well to metal. Then it is best to fill all holes and hollows with glazing putty. After thorough drying, a second coat of enamel undercoat forms a good base for the enamel. Enamel undercoat dries in from six to ten hours.

Two coats of enamel, sprayed over the two coats of enamel undercoat, will give a finish that is hard to surpass. For thorough

* Name on request.

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Keep your costs down and the quality of your work up by using a Quincy Compressor unit especially designed for spray painting.

There is a unit that will exactly fit your requirements — portable or stationary.

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Quincy Compressors

Model PX

A compact, portable three-wheel unit. Complete, ready to operate paint spray equipment. Has 20-gal. tank, pressure gauge, safety valve and drain cock; also suction unloader to maintain operating pressure of 80 lbs., which may be adjusted for any suitable pressure up to 100 lbs. The air filter is warranted by maker to be 99.9% efficient. Sizes 2½x2½ and 3 x 3½. Displacements 4.2, 6 and 8.6 cu. ft., depending upon size of motor.

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drying, the enamel should be allowed to stand overnight.

The next operation is to pounce out the letters and apply gold leaf over a varnished outline of the lettering that has been allowed to dry until sticky. After the gold leaf has been applied, brush body varnish over the lettering. For striping, either a sword striping brush or a mechanical striping gun may be used.

This procedure will give you an excellent truck finish. To economize on this schedule, the second coat of enamel undercoat may be eliminated and, if further economy is desired, the second coat of enamel as well.—W. F. Ardussi.

Finishing Steel Office Furniture

We would like some information about lacquers, enamels and varnishes suitable for finishing steel office furniture, especially about the composition and uses of new products.—Y. & E.

In answer to this question, I submit the following information:

Lacquers—Two kinds of primers for pyroxylin finishes are obtainable, pyroxylin-base primers and oil-base primers. I suggest the use of oil primers (baked) because, in my opinion, these are not easily raised by the lacquer enamel. The primer is baked for 1½ hours at 275° F. Three coats of lacquer enamel will produce an excellent finish for steel office furniture.

Enamels—I would recommend a new method which is now being used, namely, spray and bake for around 1½ hours at 250° F. A number of manufacturers can furnish the kind of material for this schedule.

Varnishes—Several grades of varnishes are on the market. For use on steel office furniture I suggest a coat of sealer and two coats of high-gloss varnish; bake for 2½ hours at 250° F., after each coat. When rubbed and polished, this should give an excellent finish.—George Moskos.

Our Rubbed Flat Lacquer Doesn't Turn Gray

Supplementing the answer to C. R. B.'s question in May issue, page 78, in regard to "a flat lacquer that can be rubbed without turning gray after the rubbing," I contend that many things can cause this grayness in the rubbed film. Perhaps, C. R. B. is forced to rub too soon after spraying. I have found it best to kiln dry all work overnight before rubbing. Other things, such as too much pumicestone, excessive sanding in the "smoothing up" operation before using oil and pumice, or too much pressure on the rubbing block, can ruin an otherwise satisfactory finish. I even caught one man using sandpaper under his rubbing block. Boy, what a job he made!

I have used a certain flat lacquer* for over two years, rubbing every piece, and I get excellent results. The rubbing we do is not a light rub but an honest-to-goodness rubbed job. This flat lacquer is used because it rubs a bit easier than clear lacquer and matches up well with the rubbed surfaces on carvings and mouldings.

This lacquer can be used on dark and colored woods (we use it on

*Name on request.

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LACQUERS containing Butanol-Solvents* have exactly the proper speed of drying—just fast enough to permit the maintenance of economical production schedules, and just slow enough to permit that freedom of flow which produces a surface requiring the minimum of sanding and polishing.

Butanol-Solvents* reduce both labor and overhead charges, *insuring lowest cost per unit of finished surface.*

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PLANTS—Terre Haute, Ind., and Peoria, Ill.

mahogany) with satisfactory results, and there is no clouding or grayness even when three coats are applied.

In rubbing, we use a neutral, nonblush rubbing oil with pumicestone under a felt pad; we use steelwool around mouldings. It is necessary to wash the surface to remove the oil film after rubbing. We let the rubbed pieces stand about two hours, then wash the surface. I will send C. R. B. my recipe for this wash if he wants it. It may be too strong for some lacquers, so it is not wise to publish it.—G. F. Huizenga.

Uniforming Stain Color at Panel Ends

We are finishing plywood at present with walnut oil stain, but at the ends of the boards where the edges have been beveled, the different colored woods show very conspicuously, which is objectionable. Some boards seem to be about the color of gum wood, and others about the color of white pine. Can you refer us to a type of stain that will color both light and dark woods uniformly in sappy places, without a subsequent touch-up operation?—Ft. W.D.C.

I suggest a non-grain raising stain such as advertised in INDUSTRIAL FINISHING. If the panels are being dipped, the color can be easily uniformed by using a sponge. Keep this sponge just wet enough to pick up excess stain on the dark parts of panels, and coat the sap a second time just before the stain drys after the first dipping. These operations can be done very rapidly, and a skilful man can uniform any variation in the panels.

If a spray is used to apply stain, color the light places first; then coat the entire panel, and an even-color job will be the result. This work requires an expert spray man with a practical turn of mind. If the panels can be placed on a rack in a booth, they can be stained very rapidly with first class results.

The case of different woods at edges of panels showing conspicuously presents "a mean proposition." The white pine will show streaks that are very hard to color. I suggest the old time tried-and-tested method of using an alcohol stain of sufficient strength and color to obliterate these places.—G. F. Huizenga.

Finishing Cast Aluminum in Old Bronze

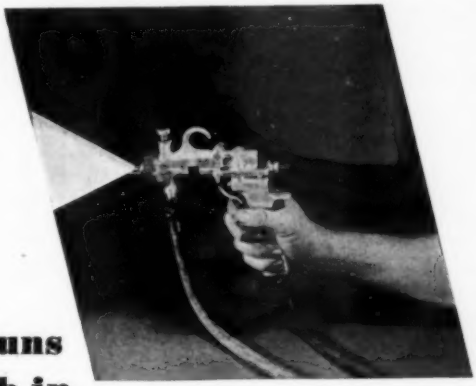
We will appreciate any information you may have for applying old bronze finish on small highly-ornamental aluminum castings made in sand moulds; also for applying the same finish on ornamental white metal die castings. —M.A.S.Co.

I presume you mean by "old bronze finish" the same finish as "old brass finish," or the same method of applying, only on bronze. There are so many different finishes on the market today that one cannot tell what a color is by its name.

Prepare your casting first, as you would for plating, and nickel plate it for 20 to 30 minutes; then bronze plate for 30 or 45 minutes.

After bronze plating, scratch brush it wet with pumicestone and water on a brass wire wheel; dry the surface and lacquer it.

If you desire to stain the castings, then acid-copper-plate them



Spraco Guns do the job in less time— and do a good job with less material

In actual tests conducted in the plant of an Ohio company, an operator using different makes of guns using the same lacquer and spraying identical pieces—turned out 20% MORE WORK with the Spraco Gun than with any of the others—and laid on a smoother finish.

Another user writes, "We are using 4 of your guns, have compared them with two other types of guns and FIND YOURS TO BE FASTER in operation and equal in quality of work."

Requiring only moderate air pressure, Spraco Guns deliver a fine, uniform spray that is "wet" its entire width and will not split. Drift, caused by an excessive volume of air at high pressure is eliminated; MATERIAL ordinarily blown through the fan as dry mist is SAVED.

Because of its properly atomized "wet" spray one stroke with a Spraco Gun lays on as smooth a coat as two or more strokes of a high pressure gun and LESS MATERIAL is required to produce a satisfactory finish.

Simple to adjust, operate and clean, Spraco Guns have many advantages not found in ordinary guns.

Please send a copy of Bulletin I-130 which describes Spraco Guns and complete industrial finishing equipment.

Mr. _____

Firm _____

Street _____

City _____ State _____

SPRACO INCORPORATED

116 Central Street Somerville, Mass.

3896

after nickel plating for 20 to 30 minutes; scour with pumicestone and water, stain in a sulphurette solution until you get the desired color; then dry the surface, scratch brush it, dry and lacquer.

If this doesn't produce the color you want, please send a sample and I will try and tell you the exact method of matching the color of the sample.—August L. Medel.

I suggest the following schedule for finishing aluminum and white metal die castings in an old bronze effect:

1—Dip parts to be finished in lacquer cleaner.

2—Spray first coat of bronzing liquid. (Antique bronze powder mixed with bronze mixing lacquer as a vehicle.)

3—Spray second coat of bronzing liquid.

4—Spray coat of burnt umber dissolved in japan and reduced with turpentine.

5—Wipe highlights before umber is dry.

6—Dry overnight and spray coat of clear lacquer.—Joseph Cowan.

Better Tumbling Finish

I am familiar with some of the tumbling finishes and have been able to do some passable work with them, but there are goods on the market that are remarkable in color and finish, and I would like some information on these materials. Some of these goods are as pleasing to the eye as a ripe red cherry. It is possible that the finish is not obtained entirely by tumbling. Some of these articles I refer to are the balls and beads used by some concerns for making bead dolls and other bead ornaments. They are like hand work yet they must be finished by a quick process. I am very much interested in this higher class finish.—A. J. B.

From the information given I believe this finish is a tumbling lacquer. By this I mean a straight gum lacquer without the use of any nitrocellulose. These lacquers tumble much cleaner and smoother than those containing nitrocellulose, and they retain a much higher luster.

The finish desired may be obtained by tumbling one coat of a pigmented gum lacquer of the shade or color desired. If the luster doesn't come up to expectations, a coat of clear tumbling lacquer may be tumbled after the pigmented coat has dried sufficiently so that the surface will not feel sticky after being held in the hand a few minutes. I am sure you will find that a pigmented gum lacquer will also give you a much cleaner color than when a gum-nitrocellulose lacquer is used—and the price of the lacquer will be much lower.—L. B. Miller.

A. J. B. fails to mention whether his problem has to do with tumble-finishing wood or metal articles. Both are equally simple; the one thing to remember is that in tumble-finishing wood a wooden horizontal barrel should be used, while for metal a regular oblique metal barrel, containing fins is desirable.

The reference to a ripe red cherry inclines us to believe that the difficulty may be due both to the method and materials. If the articles are of wood, then a stain of brighter tone than the final finish should be selected.

LET

your problems become ours

THE finishing materials you buy must give high standard results not only once, but week after week and month after month.

From your production standpoint it may be that you have encountered the problem of how to obtain such continuous and uniform results in finishes. Perhaps you are wrestling with the problem now.

The answer to it is here, the same answer that has come to the relief of many other manufacturers. Take advantage of Thresher service. Use Thresher Varnishes, Enamels and Lacquers.

Because they are produced with your needs in mind. Of finest quality, they give you quality results. And you are assured of quick deliveries and personal attention to your requirements. Let us show you what Thresher co-operation means.

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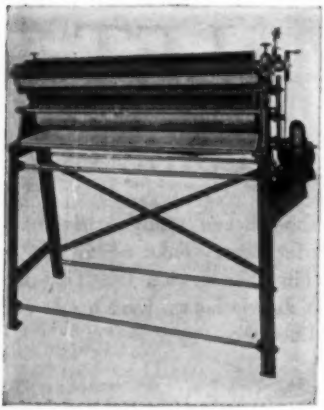

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Greater Coverage Per Gallon

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NAZ-DAR COMPANY
4014-22 N. Rockwell St.
CHICAGO, U. S. A.

Also Manufacturers of Silk Screen Process Paste Paints, Equipment and Supplies

This should be dipped, and after drying an hour the pieces should be placed in a closed wooden barrel and rolled to smooth the surfaces. If the articles are of metal, then a flat or semi-gloss ground coat should be "rolled on" in a metal barrel and baked in the usual way.

The secret of the final finishing operation lies in the character of the material used. This should be designed for tumbling and should be, not opaque, but a translucent color—a tumbling color varnish—producing a glazed finish in which the undertones shine through the top coats and produce the desired richness of color and luster.

The number of coats required depends upon the colors used and the refinement of the finish desired; some colors covering better than others. A single clear finishing vehicle and an assortment of pigments will simplify the variety and quantity of materials to stock in order to produce a wide range of finishes.

The quality of materials used is an important factor in securing satisfactory results.—A. B. Laboratories.

To Bleach Red Ochre Paint From Birch

Please tell me the best way to remove the stain which has penetrated birch wood from red ochre paint. Oil stain will not penetrate far enough to give the rich mahogany color that is desired.—G.B.K.

After all traces of the paint have been removed and only the stain of the red ochre remains, I suggest using a strong bleach, one

of which can be made as follows: Mix 8-oz. of chlorinated lime into one quart of water. Apply this to stained surfaces and, while still moist, apply a solution made by adding 1-lb. of oxalic acid to one gallon hot water. The fumes which arise from this solution will be a bit unpleasant to inhale.

Although this is a strong bleach, you may have to repeat the operation to remove all traces of the red ochre.

After the wood surface has been bleached sufficiently and is dry, wash it thoroughly with hot water, scrub out all mouldings and corners and blow out with compressed air. It will now be necessary to sandpaper the surfaces to a smooth finish.

I would advise the use of non-grain raising stain in place of the oil stain. I have used such a stain* and it gave a splendid color on birch, every bit of figure in the wood being brought out beautifully.

Some finishers do not use a filler on close-grained wood, claiming that filling is not necessary. It may not be necessary as there are no pores to fill, but some of the beauty of the wood is lost if filling is omitted, especially on birch. —G. F. Huizenga.

To Produce "Dev" Oak Finish

I am still unable to find the "Dev" oak finish for which I have been searching for some time. A better description of this finish might bring the desired information. I understand the "Dev" oak finish is an antiqued, wiped-out

*Name on request.

Reduces Cleaning Costs

XCEM industrial cleaners will do all industrial cleaning jobs Quicker, Better and at Less Cost.

Why? Because there is a specialized XCEM cleaner for every industrial purpose.

Manufacturers in all kinds of industries have standardized their cleaning operations with XCEM products because they are effective and save time and money.

We would like to demonstrate to you why the use of XCEM industrial cleaners is growing constantly.

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96 GLOSS 97 RUBBED EFFECT Amerilac Lacquers

Easily Applied Greater Coverage Less Sanding

. . . characteristics that thoroughly identify Amerilac Lacquers as dependable materials for high-grade cabinet work.

Here are finishing materials capable of producing that attractiveness, coupled with the durableness and impressionable beauty most desirable in furniture of quality.

Amerilac Lacquers satisfy in results and the smoother application obtained at lower production costs. They were developed by careful study of all factors entering into the successful employment of finishes.

Try Amerilac Nos. 96 and 97, and be convinced. Your Inquiries Solicited.

The American Varnish Co.

High Grade Varnishes, Pyroxylin Finishes, Stains, Fillers and Enamels

1138-1146 N. Branch St., Chicago

finish rubbed dull; it is not a Cathedral oak finish, although, it has a cast like it—but it has a reddish cast also. I have seen this finish and have tried to reproduce it, but without the success that I would like.—E. R. J.

"Dev" oak finish is somewhat of a mystery to us, but from the description given, we have produced an attractive effect economically, as follows:

First: The wood was sanded and then spotted with lacquer sanding sealer.

Second: A spray coat of permanent stain was applied immediately.

Third: Four hours later the panel received a spray coat of lacquer sanding sealer.

Fourth: One hour later the surface was sanded lightly and given a full spray coat of wood finishing flat lacquer.

The materials used for this finish are from a complete line which enables the finisher to produce any shade to meet the individual taste. The spotting referred to in the first operation affords the finisher an opportunity to express his own idea of the shading desired, for obviously the stain will fail to "take" as much in the lacquer spotted areas as in those not so treated.—A. B. Laboratories.

A good finish is a business builder. No piece of furniture is better than its finish and a poor finish can ruin the finest example of furniture craftsmanship. Finish is only a detail, perhaps, in furniture manufacturing, but it's a vitally important detail.

New Materials and Equipment

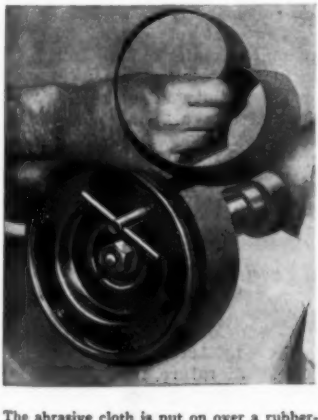
Presenting briefly, certain outstanding features of new or improved materials, supplies and equipment which have been developed and made available for use in modern industrial finishing departments

Rubber Cushioned Buffer

C. B. Hunt & Son, Salem, Ohio, has developed a rubber-cushioned buffing wheel designed to do a variety of buffing.

According to the statement of the manufacturer:

"Buffing operations are being speeded up and buffing costs impressively reduced with the new Quick-As-Wink Buffing system. Abrasive cloth of any grade, from 24 to 180 grain, can be used and a new band can be easily put on without removing the wheel from its spindle. Strips of abrasive cloth may be attached with or without metal end-clips. A slight turn of the wrench tightens the strip on its wheel and the rotation of the wheel causes a slight expansion of the rubber cushion, so that the abrasive cloth hugs the entire surface tightly. This makes any slipping of cloth impossible at any speed or pressure."



The abrasive cloth is put on over a rubber-tired, metal wheel.

The method of applying abrasive cloth and the strength of construction involved permit safe operation at high speeds. Before shipment, each wheel is tested at speeds up to 8,000-r.p.m., although speeds ranging from 3,500 to 5,000-r.p.m. are recommended as most efficient.

Quick-As-Wink cushion abrasive wheels are made in 6, 8 and 12-in. diameters, and they give a clean smooth buffing action the full width of the face of the wheel, on either stationary or flexible-shaft buffers.

The Hunt company supplies abrasive cloth strips to users, either with or without the metal clips; also a combination cutter and clipper, capable of turning out 300 bands per hour, has been built and furnished to a number of large users.

New Gasoline Powered Spraying Outfit

The Metal Specialties Mfg. Co., 338 Kedzie Ave., Chicago, Ill., announces an addition to its complete line of spraying equipment —the gasoline powered Presto spraying outfit—for users who

A Good Finish *Pays For Itself* In Added Sales Appeal

NO matter what market you serve or grade of furniture you build—finish is an item which must be right. A good finish means so much to the successful sale of your product providing as it does a window of quality through which your dealer's customers may see your product — and judge its worth.

Users of J-W-F products know from experience how dependably good these finishes are. Should you be one of those who are not using J-W-F products—we ask that you try them. Nothing we might say is half so convincing—or demonstrative of the real worth—than a rigid testing in your own plant. Better arrange to make this test at once—for it may mean a lot in added sales appeal and profits. Write.

■

Jamestown Wood Finishing Co. products are guaranteed. If they will not do for you what we claim for them your money will be refunded.

■

Jamestown Wood Finishing Company

Executive Offices and Plant

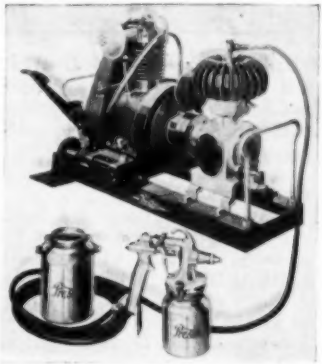
JAMESTOWN, NEW YORK

BRANCH OFFICES: Milwaukee, Wis. Meriden, Conn; New York City; Lenoir, N.C

STAINS - FILLERS - SHELLACS
VARNISHES - LACQUERS - ENAMELS

prefer gasoline power, or who wish to do spray painting where electricity is not available. .

According to the manufacturer: "The Model 177 is compact, perfectly balanced, vibrationless, easy to start and extremely



smooth and quiet in operation. It completely atomizes both light and heavy materials, such as oil-and-lead paints, lacquers, shellacs, varnishes, and enamels—eliminating excessive fog and mist.

"The size of spray and the amount of material applied can be regulated directly from the trigger or by giving a slight turn to the knurled sleeve on the adjustable needle valve."

Sign Painting With a Spray Gun

A new process for painting signs with a spray gun has been announced by the Nu-Way Sign Painting Co., 648 Broadway, Denver, Colo. According to the company's literature, the chief features of the system are as follows:

Letters can be produced in the

ADVERTISING PAGES REMOVED

same material as the base or field; for example, lacquer letters on a lacquer finish, paint on paint, etc.

An important factor in the success of this system is the company's Nu-Way gum, described as "a superior gum that holds the tape or stencil cloth on the object, and which has none of the disadvantages characteristic of old type gums and tapes."

For those who do not prepare their own stencils, the company is prepared to design a standard line of copy; also any stencil style desired.

Further: "Uniform and professional-looking letters can be produced on any surface by a comparatively unskilled workman. The expert sign painter, instead of being eliminated by this new method, can triple his volume and income.

"The gum is sold separately or with sets of letters and designs. Complete directions for the making of signs are included with these materials. A folder outlining this system reveals interesting and informative data about the new process.

Portable Airpainting Unit

A new ½-h.p. airpainting unit is now offered by the Paasche Airbrush Co., 1921 Diversey Pkwy., Chicago, Ill. This outfit has a

A compact outfit.

WATERPROOFED

CADILLAC SHELLAC

has an "unblushing" disregard for moisture. *It will not turn white.* And it costs no more than the regular grade.

Sample gladly sent on request

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New type—ultra modern "Air Exit" Ventilating and Drying Fan . . . 2 to 6 blades

Aeroplane Propeller fan blades are universally recognized as the most efficient and economical . . . and the blade which our engineers have designed and developed (constructed of Nickel Alloy Aluminum) is practically perfect in these respects.

Note exclusive motor bracket—gives better frame support and can be adjused to fit any motor.

Write for price and descriptive circular . . . . you'll be surprised.

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Finco

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Water Stain—

requires ***no sanding . . . . . no wash coat . . . .*** saves 24 hours in the finishing room. One furniture manufacturer saves $1.50 on every dining room suite.

Positively fast to light . . . . made only from water aniline colors. Inquiries solicited. We will be pleased to demonstrate this product or send samples for you to try . . . . Our service department is at your disposal.

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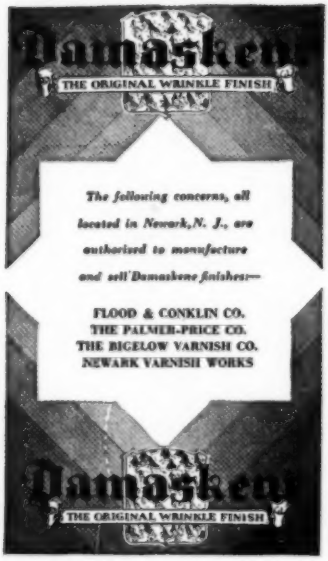
3725 E. 13th St. Indianapolis, Ind.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THE ORIGINAL WRINKLE FINISH
The following concerns, all located in Newark, N. J., are authorized to manufacture and sell Damaskene finishes—
FLOOD & CONKLIN CO.
THE PALMER-PRICE CO.
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Damaskene
THE ORIGINAL WRINKLE FINISH

silencer air-cooled handle and ball-bearing swivel casters that provide easy portability.

Specifications include: ½-h.p. motor, (repulsion-induction, 1150-r.p.m.) directly connected to a 1⅞x2-in., Worthington, feather-valve, compressor; force-feed oiling system; copper cooling coil; water and oil separator; gauge and fittings; 15-ft. of electric cord ready to attach to light socket; 3-gallon clamptight pressure tank unit; an airbrush; 20-ft. of ⅜-in. fluid hose; couplings and gooseneck valve, 20-ft. of ¼-in. airbrush hose; and 20-ft. of ¼-in. airline hose.

Aircraft Flexible Lacquers

Today there is a large and fertile field in the aircraft industry for manufacturers of high-gloss flexible lacquers, but these manufacturers must do considerable work along the lines of educating the aircraft industry as to the merits of lacquer as a finish in comparison to pigmented dopes.

The employment of practical finishers as salesmen and demonstrators is the one best bet. Among the aviators and pilots that some firms use as salesmen, few succeed in the finishing sales line, although usually they do make good as aircraft salesmen. Generally, the man buying finishing materials is chiefly interested in the merits of the products being sold.

At the Aircraft Show in New York City, May 3 to 10, I was pleased to notice that a large number of aircraft manufacturers are adopting the high gloss lacquer as a finish over clear dope. Some manufacturers still stick to pigmented dope as a finish—perhaps for no other reason than that the

U. S. air forces have never approved the lacquer finish. The U. S. air forces hold that lacquered fabric cannot be re-doped. Well, my answer is that the use of a good lacquer extends the period of refinishing.

When a pigment-doped ship requires re-doping, the best bet is to re-cover it, because you can rest assured that when that time arrives the surface will be so badly cracked and ring-wormed that it will not warrant re-doping. It is my experience that the present type of lacquer possesses wonderful flexibility, whereas pigmented dope does not.

Recently, I received a copy of a pamphlet about lacquer, the pamphlet being issued by a firm whose name is well known in the industrial finishing field and whose reputation is A-plus. This firm illustrates a patented device showing a 6-in. elongation of its lacquer. It declares in its pamphlet that no airplane, finished with its lacquer ever had to be recovered.

You may say that is a "broad statement"; nevertheless, I believe it's a fact, as I have examined six airplanes finished with this firm's lacquer and I could not discover even a minute crack on the finished surface—and these ships were in active flying service for more than one year. I hold no brief for this particular company or for any other paint firm; the point I wish to make is that the present type of lacquer will stand up under the most severe tests. —Denis O'Brien.

The finish is to fine furniture what the highlights and shadows are to a fine oil painting. Care in finishing means enduring beauty.

Your Health *Demands* PULMOSAN Protection!

The PULMOSAN Chemical Cartridge Respirator protects you against fumes, vapors and dust while spraying.

It cleans all air you breathe.

For better health . . . and more efficient work — adopt PULMOSAN, the respirator rated 99.7% effective *by actual test.*

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Gentlemen: Send us details on your chemical cartridge respirator.

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Industrial Finishing

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

PRACTICAL PUBLICATIONS, Inc.
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Advertising rates on application.

EDITORIAL

Materials Plus Motion Make Industry

An interesting point brought out in the careful studies of business and industrial management is that industry and business are made up of *motion applied to materials.* There are the things known as "raw materials" which enter into industry and which include all the substances used. Then the remainder of the industry consists in the moves necessary to convert and fabricate these materials into finished products, and to move the finished products to market.

So in making industrial progress there are just two broad lines to study—one of materials and one of motion. The motion, of course, includes the movements of power-driven machines that carry on with work as the major factor, but this involves also the movement of materials from one work station or machine to another, and the motions of the men in charge of the work.

In the final analysis, however, industry is a matter of motion applied to materials, and when we consider it in this light it should simplify the matter of systematic study with a view to making progress in efficiency and the development of better materials and methods.

Keep in Touch With What's Popular

Since so many manufacturers have been resorting to fine finishes and intriguing decorative effects to attract favorable attention to their products, some remarkable finishes have been developed and adopted. Indications are that the autumn show windows at fashion centers will reveal much that is new and interesting in designs and finishes. All who use finishing material for decorative effect will find it profitable to plan on paying regular visits from now on to whatever exhibits of manufactured goods are scheduled, and also to visit the most fashionable retail stores in large cities for the purpose of learning what's new in style trends and sales-appeal finishes—and to find out what goods are selling.

The period of depression isn't going to last forever, and the majority of individuals and firms look for a decided stimulation in business activities this fall. During the several months of comparative quiet, the minds of progressive management have been thoroughly alert and accurate, investigating, analyzing and planning constructively for the future.

Some manufacturers are relying upon the surprise feature of

novelty designs and finishes to produce quick sales of profitable proportions. Others are incorporating new utility features, improved values and merits of recognized worth, so they and their representatives can honestly and proudly sell on a basis of service value instead of simply cheapness; in other words they are "making things to serve" instead of "making things to sell." Manufacturers who are not in close touch with this activity, or the results of what is going on, are automatically placed in position to lose potential sales.

Plants That Need Improvement; Opportunities

Who can think or who wants to think of a better time than now to convince the management of a nationally known concern that this is the time to begin a program of complete modernization in its finishing department? There are many good prospects available for a program of this kind. For example, we have access to a confidential report, which in part reads as follows:

"For all of the high sounding name this company bears it has one of the worst and poorest equipped plants of any. . . . For instance, in the ——— department, which is merely a table and a homemade wooden rack to hold the rolls, they have no roll cleaner, no partitions around the space, and stock is crowded all over the place. The plant has no conveyors anywhere; everything is moved on hand trucks. Floors full of holes, and equipment, such as it is, is poorly laid out."

Here is a concern that not only can afford modern equipment, but which obviously should have it in

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Samples and a booklet on Finishing available on request
LACQUER & CHEMICAL CORP.
214-222 40th ST. BROOKLYN N.Y.
CHICAGO makers of ALAKA PHILADELPHIA

STENCILS for SCREEN PROCESS

FOR oil paint reproduction of artistic commercial and decorative effects on any smooth surface or substance.

Screens made from your designs or we will furnish art and screens complete.

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AUTOMOTIVE FINISHING COMPLETELY COVERED

A detailed study of modern methods of automobile painting; carefully written in non-technical terms. This book contains much useful information, both for the shop owner and finisher; explaining methods of preventing; checking and cracking, water spotting, peeling, chipping, flaking and many other helpful ideas.

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16 CHAPTERS.....PRICE $3.00

Remittance with order, please

INDUSTRIAL FINISHING
802 Wulsin Bldg., Indianapolis, Ind.

the finishing department. Perhaps the management hasn't been approached or worked on hard enough by representatives of equipment manufacturers. At any rate, here is a prospect that is evidently in need of not only just one piece of equipment, but an entire outfit installed, arranged and operated for economical, volume production. It's an engineering job that should be supervised by someone really experienced in everything having to do with metal cleaning, finishing, graining, oven-drying, polishing and mechanical conveying—and probably also heating, lighting and ventilating.

Why More Large Concerns Are Successful

What is responsible for the success of many large concerns, including groups formed by mergers of smaller concerns, is not so much production economies, in all cases, as it is favorable conditions and prices that can be obtained by purchasing in quantities, and merchandising on a large-scale basis supplemented by national advertising. Really, the advertising feature was especially emphasized in a speech recently delivered by Dr. Williard L. Thorp, Professor of Economics in Amherst College. He declared that:

"It is an interesting sidelight on our current economic life that although these large companies cannot in many instances turn out goods at lower costs, nevertheless they are steadily absorbing a larger and larger proportion of the nation's markets. The small concern still maintains its position. The middle sized companies are suffering. But so many of our purchases today do not depend upon price differences of a few

cents. In fact at least one manufacturer has capitalized his few cents of higher cost in his advertising. We are more apt to buy because of advertising, or other marketing methods. It is along these lines that the large producer is making rapid headway."

Not only does wise and continuous advertising introduce a product to prospective buyers and further inform and remind them about its merits and uses, the advertising also helps to establish confidence and prestige in the product and in the firm that makes it.

Wood Finish Shading to a Uniform Color

The use of many pieces of wood that otherwise would be cast aside because they vary in color, is now made possible by skillfully shading them to a uniform color. Gum wood pieces can be shaded to match case-goods fronts, which are of a more expensive wood. Since there are at least four different types of gum wood, the spray man must understand their characteristics, so the wood to be shaded will match the other pieces used in the article.

The sap in walnut or mahogany can be shaded to the color of a perfect piece of walnut or mahogany. The aged maple color that is so popular today, is easily reproduced on gum, if the workman who does the shading knows his job.

The essentials of satisfactory and economical shading are as follows:

1—The right shading material for the job.

2—The spray operator must understand color and know when he has the correct shade.

3—The operator must know his spray gun; the amount of pressure or "squeeze" on the trigger for shading, and the correct angle to hold the gun to produce the desired shade—these two things are particularly important.

I use only about 40-lbs. air pressure for shading, and operate the spray gun "wide open," regulating it by the trigger alone, as any amount of material required can be shot onto the surface where it is needed. This is learned by practice; and it will be found that shading can be done just about twice as fast as when the gun is operated half way open.

Lacquer shading stains are the most suitable in my opinion, as with these the finisher can increase production and can handle case goods with some speed after the surfaces are shaded. I find that the best time to do shading is after the first coat is applied, then it can be easily seen where the surface really needs shading.

Shading and highlighting are two different jobs. It is very easy to make one area dark and let another place remain light, but when the whole piece must be shaded to one color—the finisher must be experienced in this work to turn out a satisfactory uniform shade. In my time, I have known many expert spray men who were not capable when it came to shading. —Leon P. Altland.

Not only is it necessary that a product be satisfactory in construction—above all, it must have true style appeal.

Success in modern industry, however, demands that executives work together and think together to produce a composite result.

Classified Advertising

Advertisements under this heading 45 cents a line per insertion, minimum charge, $1.35. In estimating, calculate six words to one line, and add one additional line for heading. Use this department to obtain help, find positions, buy and sell equipment, dispose of manufacturing properties, etc.

FINISHING ROOM FOREMAN

Wanted by factory in eastern Pennsylvania making high-grade bedroom furniture. Excellent opportunity for the right man to make a connection with a growing firm. State age, experience, previous employment and salary expected to start. Address IF-342, care Industrial Finishing.

SALESMAN WANTED

By established lacquer manufacturer in South and Southwestern territory. In writing, state age, education, experience and salary expectations. Address IF-344, care Industrial Finishing.

MICHIGAN SALESMAN

With following of years' standing, wishes to connect with old established house manufacturing full line industrial finishes. Address IF-340, care Industrial Finishing.

MAN WANTED

Familiar with paint grinding and tinting for a general line of House and Industrial Paints and Enamels. A man who is not afraid to work. Write experience. References will be required. Address IF-341, care Industrial Finishing.

SALES REPRESENTATIVES WANTED

Conscientious sales representatives are offered an exceptional opportunity to sell an absolutely incombustible steel paint to large industrial users. Practically non-competitive and virgin field in Oil Refineries, Utility Corporations, Railroads, Smelting Refineries, etc. Representative's territory protected. Commission extremely liberal. Outline your qualifications to cover above fields. Address IF-339, care Industrial Finishing.

ADDITIONAL CHEMIST AND FORMULATOR

Of breadth and experience, required by Reputable Eastern Lacquer manufacturer. Good future for good man. Write fully experience, references, and compensation. Address IF-343, care Industrial Finishing.

LACQUER SALESMAN WANTED

for Chicago territory by high-class Eastern Lacquer manufacturer. Chemist or engineer with good lacquer experience preferred. Excellent prospect for active, intelligent go-getter. State experience, references, compensation. Confidential. Address IF-345, care Industrial Finishing.

BARGAIN FOR QUICK SALE

Despatch Gas Enameling Oven, 6' x 6' x 8'4" wall. Like New. A. L. SPRAYER CO., Albert Lea, Minn.

WANTED— SALES REPRESENTATIVES

Now calling on the following industries

Light and heavy metal stamping, metal spinning, metal pressers, metal furniture, automobile bodies, automobile dealers and painters and all other industries applying paint and lacquer to bare metal surfaces, to represent a process that is revolutionary in its economical application and results, when used in conjunction with what you are now selling, and will produce better results in the finished work.

Representing this product will not conflict or compete with your line. Any man, of proven sales ability, desiring to represent this meritorious product as a side line, will find this opportunity a most unusual one in that the above industries have been looking forward for a product such as this. Orders, therefore, must surely follow. Remuneration to be on a liberal commission basis. All applications strictly confidential. Address IF-335, care Industrial Finishing.